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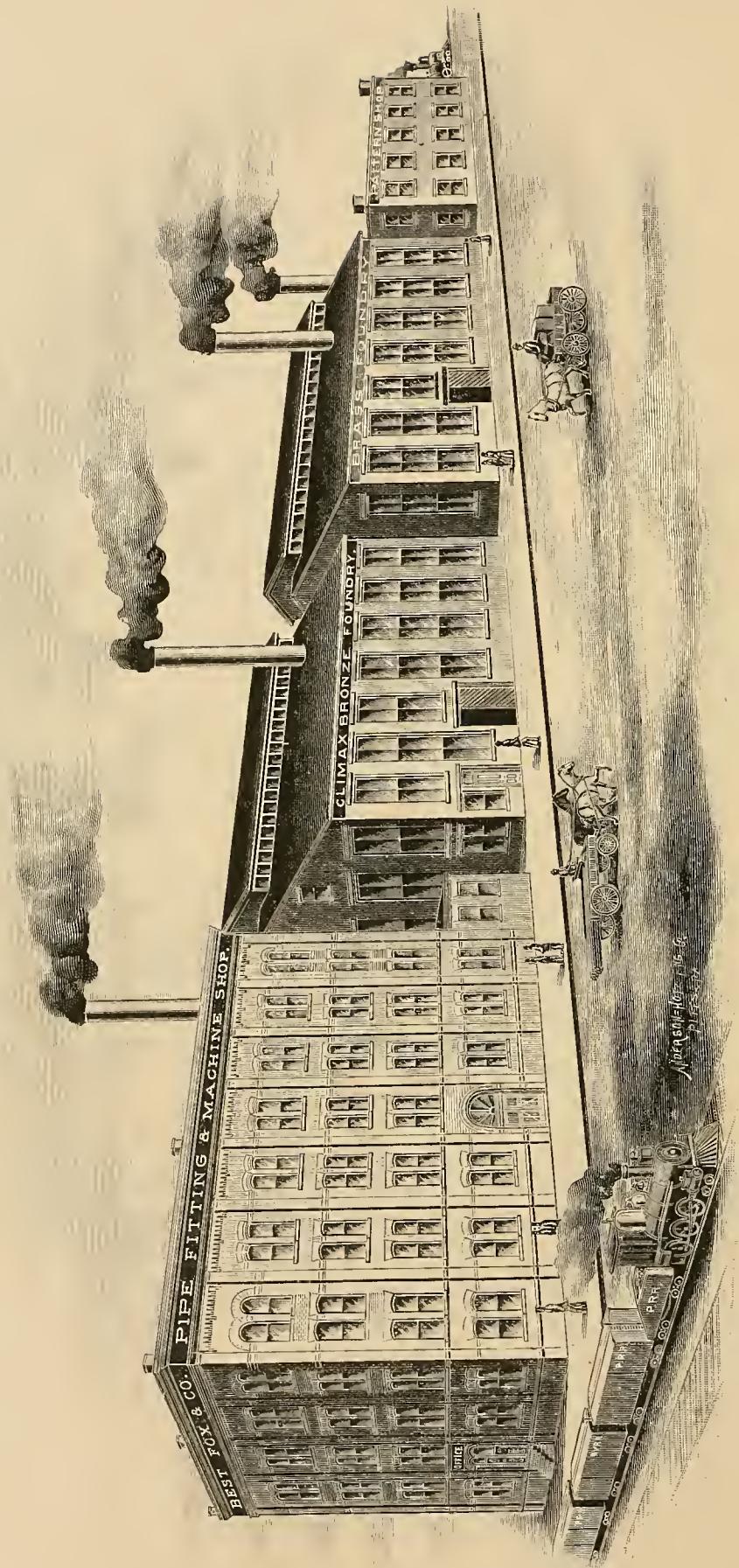












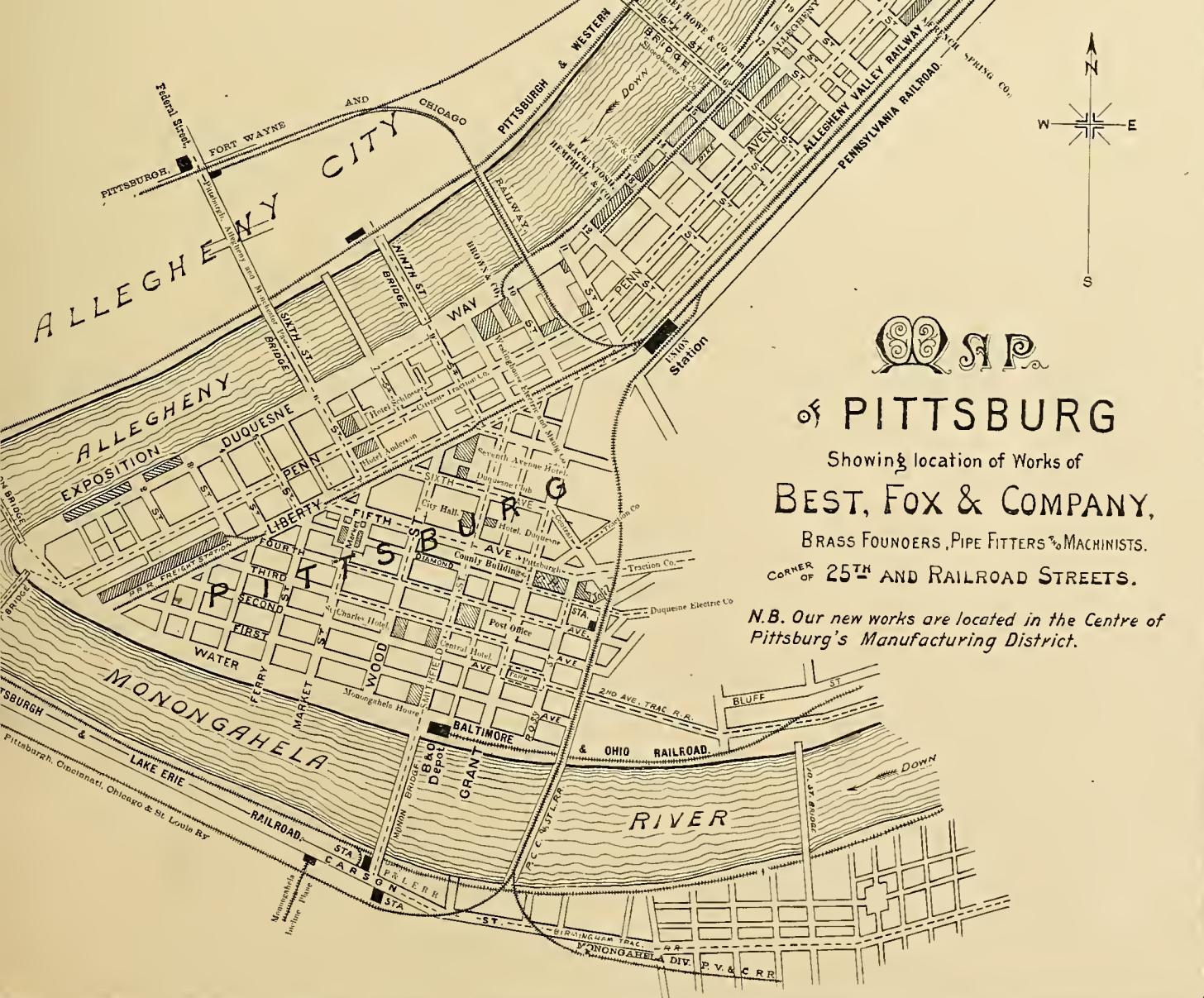
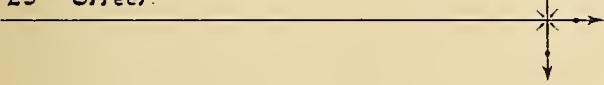
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## HOW TO GET THERE?

From UNION DEPOT - down 11<sup>th</sup> Street one square, to Penn Ave - Take Citizens Traction Line (Yellow or Brown Cars) to 25<sup>th</sup> Street (6 minutes ride).

From BALTIMORE & OHIO AND PGH & LAKE ERIE DEPOTS take Birmingham Traction Cars to Union Depot and Citizens Traction Line from that point.

From DEPOTS in Allegheny take ANY LINE TO PITTSBURG, changing to Citizens Traction Line on Penn Ave. thence by that line to 25<sup>th</sup> Street.



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## OF PITTSBURG

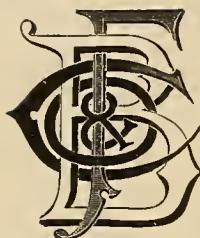
Showing location of Works of

**BEST, FOX & COMPANY,**

BRASS FOUNERS, PIPE FITTERS & MACHINISTS.

CORNER OF 25<sup>TH</sup> AND RAILROAD STREETS.

N.B. Our new works are located in the Centre of  
Pittsburg's Manufacturing District.



TRADE MARK

CABLE ADDRESS "BESTFOX" PITTSBURGH.

DIRECT COMMUNICATION TO ALL POINTS.

## TELEPHONE AND TELEGRAPH MESSAGES

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ALL HOURS, DAY AND NIGHT.

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Catalogue

ESTABLISHED 1884.

GEORGE BEST.

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WM. H. H. SHEETS.

BEST, FOX & CO.,

BRASS FOUNDER, IRON PIPE FITTERS  
AND  
MACHINISTS.

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SOLE MANUFACTURERS OF

CLIMAX BRONZE,

ALSO

VALVES AND FITTINGS.

• • • •

DEALERS IN

PIPE, FITTINGS AND SUPPLIES  
FOR ALL PURPOSES.



Pipe from  $\frac{1}{8}$  to 24 Inch Diameter Bent to Order.

Heavy Pipe Work a Specialty.

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OFFICE AND WORKS,

TWENTY-FIFTH & RAILROAD STS. & ALLEGHENY RIVER,  
PITTSBURGH, PA., U.S.A.

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CATALOGUE A.

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ESTABLISHED 1884.

## ANNOUNCEMENT.

## FIRST CATALOGUE.

IT IS WITH PLEASURE that we present our first Illustrated Catalogue to our friends, and hope it will prove to be of value to them.

The illustrations show the principal articles we manufacture and handle. We invite enquiries for anything in the pipe fitting, machine or brass foundry line that may be wanted and is not shown.

## TEN YEARS OLD.

Ten years ago we began business in a small shop. Reliable work and prompt delivery have increased our business to such an extent as to require the large buildings shown in which to execute our work.

## NEW SHOPS.

Our new fitting and machine shop, and brass and bronze foundries, are among the largest and best equipped in the country. We make bronze castings weighing from 1 oz. to 12,000 lbs., of any character, and lead the world in Bronze Cooling Specialties for Blast Furnaces.

## LARGE PIPE BENDING.

Our equipment for making valves and fittings from 48 inches down is complete, and our power appliances for bending wrought and steel pipes are not equalled anywhere.

## PLANS.

We have experienced fitters to erect pipe work in all parts of the world.

## SHIPPING FACILITIES.

Plans and specifications submitted for any work in our line.

With sidings from Pennsylvania R. R. system directly in front of our property, and from the Baltimore & Ohio immediately in the rear, (and property also abutting on the Allegheny river) we have unsurpassed shipping facilities.

We will use the same diligence and zeal that achieved our past success to retain and increase our business in the future.

We thank our many friends for past favors, and shall endeavor to merit future orders from old and new customers by prompt and careful attention to all business entrusted to us.

Sincerely,

BEST, FOX & CO.

Pittsburgh, Pa., October 1st, 1894.

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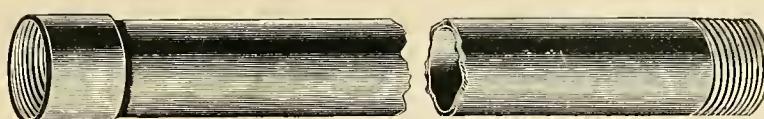
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"    Chapman Gate.....	32
"    Chronometer.....	58
"    Climax Gate.....	27, 28
"    "    Globe, Angle and Check.....	23—25
"    Coke Oven, Brass.....	37
"    Critchlow.....	54
"    Cross, Brass.....	37—39
"    Fairbanks.....	33
"    Foot.....	36
"    Gate, Brass.....	40
"    "    Hydraulic.....	53
"    "    Iron.....	27—33
"    Glenn's Hydraulic.....	53
"    Globe, Brass.....	37—39
"    "    Hyd.....	53
"    "    Iron.....	23—26
"    Handy Gate.....	40
"    Hydraulic.....	52, 53
"    Jenkins, Brass.....	39
"    "    Iron.....	26
"    Kennedy ".....	32
"    Lunken Gate.....	40
"    Myers Patent Blow-off.....	35
"    Powell's Star Brass.....	38
"    Pump.....	86
"    Radiator.....	37
"    Regulating.....	58, 66, 67
"    Relief.....	54

## W

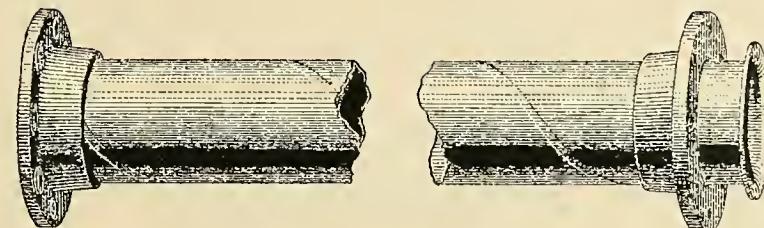
Wall Coils.....	66
Walworth Stocks.....	73
Washers.....	72
Waste Nuts.....	9
Water Alarms.....	46
"    Filters.....	60
"    Gauge Columns.....	46
"    Ganges.....	45
"    Indicators.....	46
"    Meters.....	59
"    Pipe.....	1
"    "    Tank Indicators.....	57
Waters' Governors.....	57
Watson's Regulating Valves.....	58
Welded Joints, Electrically.....	20
Well Barrels.....	78
Westinghouse Meters.....	59
Weston's Pulley Blocks.....	69
Wheels, Trolley.....	88
"    Worm.....	89
Whistles and Valves.....	45
Williams' Water Columns.....	46
"    "    Indicators.....	46
Windlass.....	69
Wire Rope.....	69
"    Wrapped Hose.....	86
Wooden Tanks.....	77
Wood Pulleys.....	71
"    Screws.....	72
"    Water Pipe.....	1
Working Barrels.....	78
Worm Wheels.....	89
Wrenches.....	75, 76
"    Cock.....	41
Wrought Iron Flanges.....	15
"    "    Necks.....	15
"    "    Nipples and Sockets.....	8
"    "    Pipe.....	1—6

## Y

Y's Bowl.....	21
"    Cast Iron.....	13
"    Flanged.....	17
"    Valves, Brass.....	40

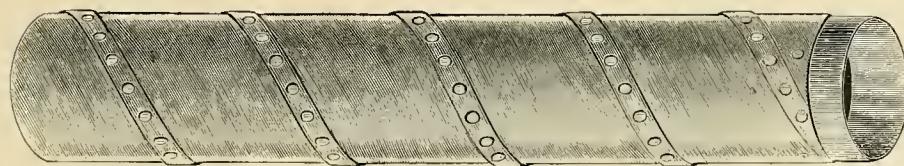
**STEEL OR WROUGHT  
IRON PIPE.****BLACK OR GALVANIZED.**From  $\frac{1}{8}$  inch to 15 inch diameter  
inside.See dimensions, **page 3.**See table, **page 107.****FIG. 1.****SPIRAL WELD PIPE.**

From 6 inch to 24 inch diameter.

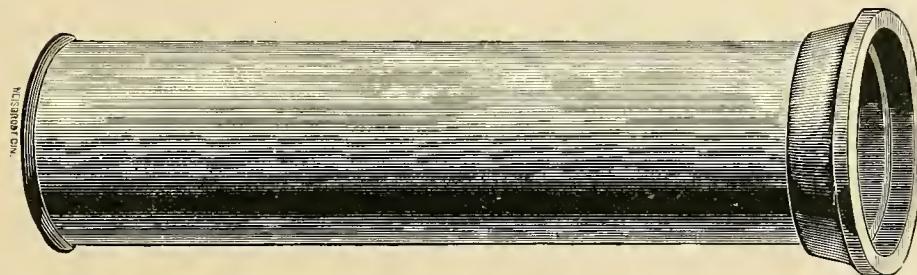
See table, **page 108.****FIG. 2.****SPIRAL RIVETTED  
PIPE.****BLACK OR GALVANIZED.**

From 6 inch to 24 inch diameter.

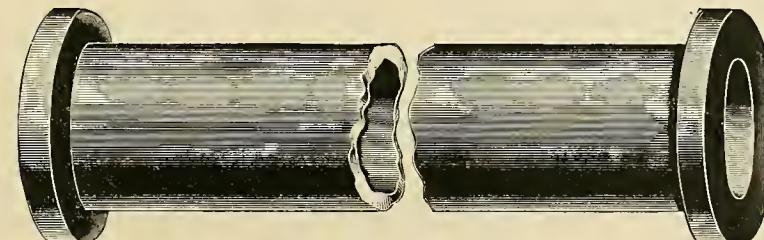
Plain, Flanged or Bowl ends.

See table, **page 108.****FIG. 3.****CAST IRON BOWL  
PIPE.****FOR WATER AND GAS.**

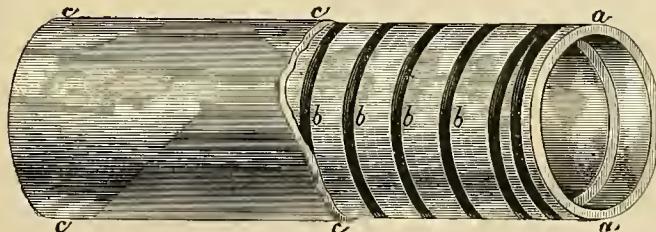
From 2 in. to 60 in. diameter.

See table, **page 109.****FIG. 4.****CAST IRON FLANGED  
PIPE.****FOR STEAM AND WATER.**

From 3 inch to 48 inch diameter.

See table, **page 110.****FIG. 5.****LIGHT CAST IRON  
SOIL PIPE.**

From 2 inch to 12 inch diameter.

See table, **page 111.****FIG. 6.****WOOD WATER PIPE.**From  $1\frac{1}{4}$  inch to 16 inch diameter.For Mines, Tanneries, Acid Works,  
etc.See table, **page 111.****FIG. 7.**

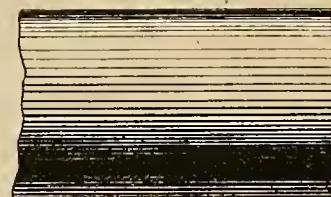
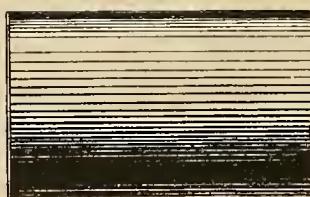
Descriptive circular of any of the above pipes on application.

**STEEL OR WROUGHT IRON  
BOILER TUBES OR O. D. PIPE.**

From 1 inch to 30 inches diameter.

See dimensions, **page 4.**

See table, **page 112.**

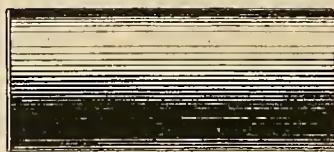


**FIG. 8.**

**LAP WELD CASING.**

From 2 inches to 9 $\frac{1}{2}$  inches diameter.

See table, **page 111.**



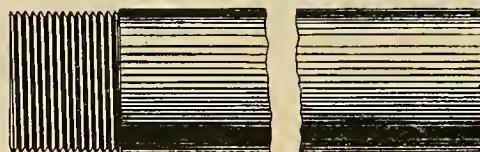
**FIG. 9.**

**EXTRA HEAVY PIPE.**

From  $\frac{1}{8}$  inches to 8 inches diameter.

See dimensions, **page 5.**

See table, **page 113.**



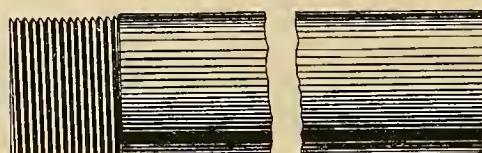
**FIG. 10.**

**DOUBLE EXTRA HEAVY PIPE.**

From  $\frac{3}{8}$  inch to 8 inches diameter.

See dimensions, **page 6.**

See table, **page 113.**



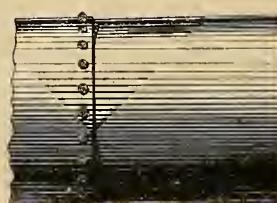
**FIG. 11.**

**RIVETTED PIPE.**

**HEAVY AND LIGHT.  
BLACK OR GALVANIZED.**

From 8 inches to 60 inches diameter.

For any pressure.



**FIG. 12.**

**SEAMLESS BRASS AND  
COPPER PIPE.**

**HEAVY AND LIGHT.**

From  $\frac{1}{8}$  inch to 8 inches diameter.

See table, **page 114.**



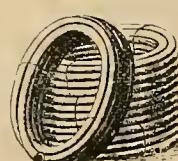
**FIG. 13.**

**LEAD PIPE.**

**HEAVY AND LIGHT.**

From  $\frac{1}{4}$  inch to 2 inches diameter.

See table, **page 114.**



**FIG. 14.**

## STANDARD SIZES STEEL AND WROUGHT IRON PIPE.

Butt Weld  $1\frac{1}{4}$  inch and below.

See Table, page 107.

Lap Weld  $1\frac{1}{2}$  and above.

FIG. 15.

We keep **in stock** all sizes to 15 in. inside diameter, and **Cut, Thread, Bend and Fit** any size to order.

No pipe **threaded** above 15 in. internal or 16 in. external diameter.

## STANDARD SIZES O. D. PIPE OR LAP WELD BOILER TUBES.

MADE OF CHARCOAL IRON OR SOFT STEEL.

See Table, page 112.

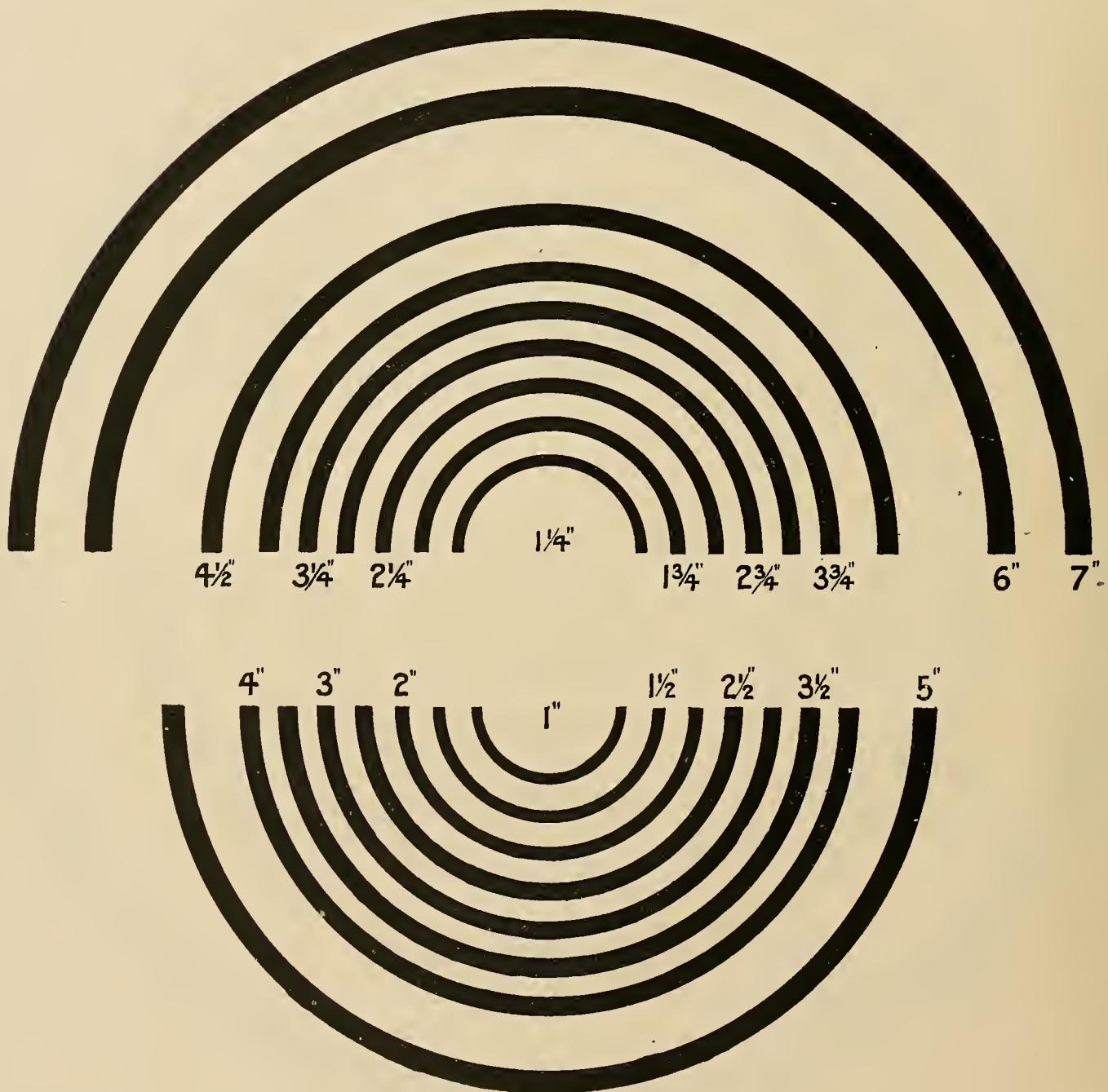


FIG. 16.

**Tubes** to 30 in. diameter and of any length, Cut and **Bent** to order.

## STANDARD SIZES EXTRA HEAVY PIPE.

See Table, page 113.

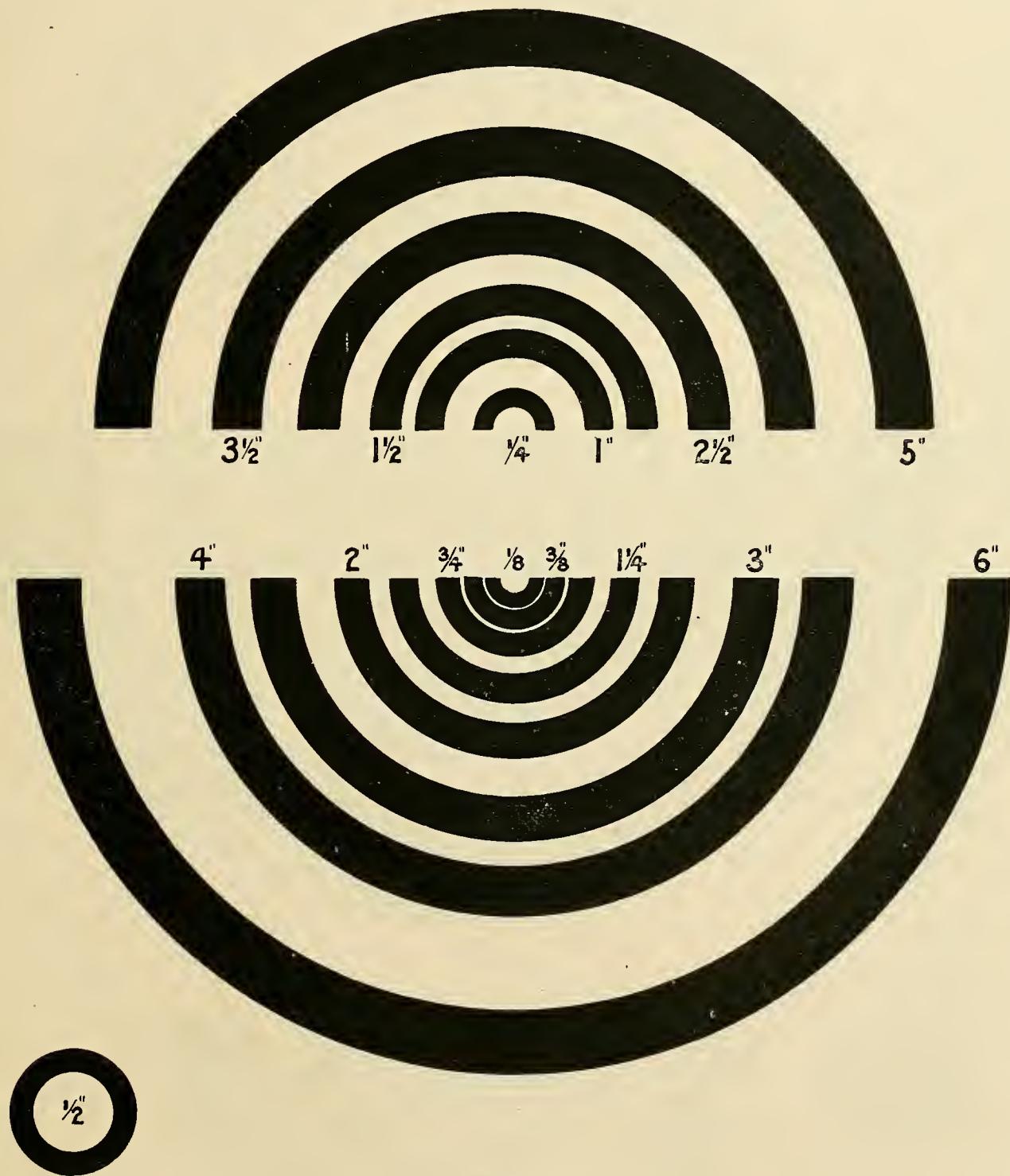


FIG. 17.

All the above sizes and to 8 in. kept in stock, and Cut, Threaded and Bent to order.

NOTE—External diameters remain the same as standard pipe, and internal diameter is decreased to obtain additional thickness.

## STANDARD SIZES DOUBLE EXTRA HEAVY PIPE.

See Table, page 113.



FIG. 19.



PIPE OF SPECIAL  
THICKNESS TO ORDER.

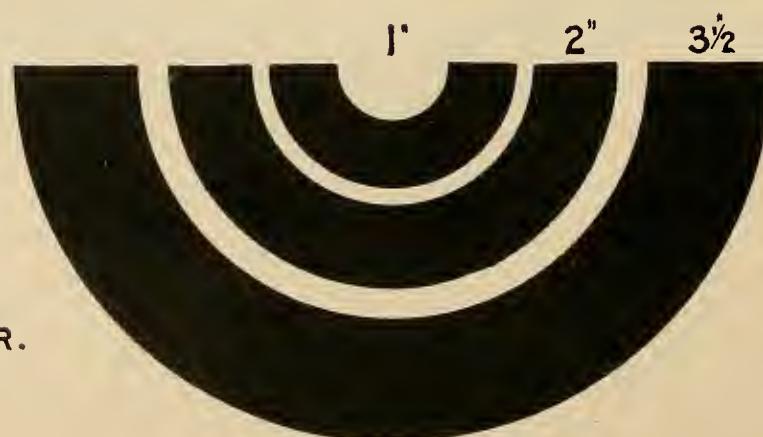


FIG. 18.

Any of the above sizes and to 8 in., Cut, Threaded and Bent to order.

NOTE—External diameters remain the same as standard pipe, internal diameter is decreased to obtain additional thickness.

FIG. 21.

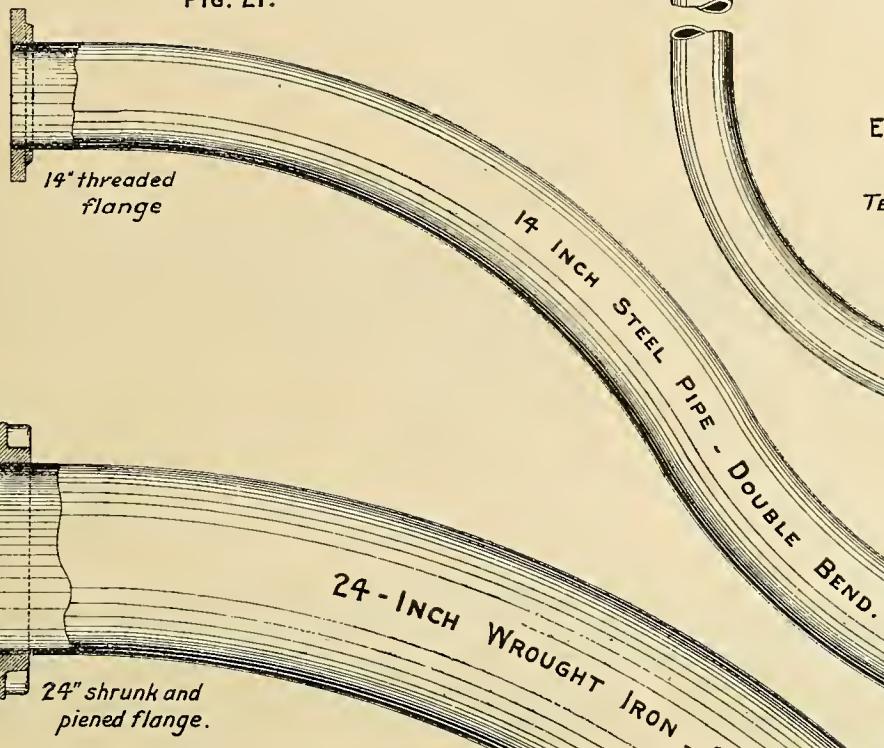


FIG. 20.

8-INCH  
EXTRA HEAVY STEEL PIPE  
U BEND.  
TESTED 1200 LBS PRESSURE.

14" threaded flange



FIG. 24.



1/4 PIPE SYPHON  
FOR GAUGES.

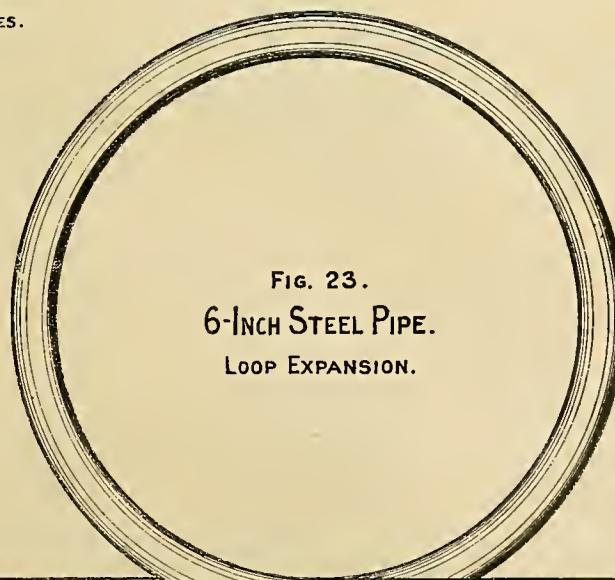


FIG. 23.

6-INCH STEEL PIPE.  
LOOP EXPANSION.

FIG. 22.

Scale  $\frac{1}{2}$ " = 1 FT.

Scale  $\frac{1}{2}$  in. = 1 Foot.

PIPE OF ANY SIZE  
BENT TO ALL PRACTICAL SHAPES.

Riveted Flange  
Steel

## WROUGHT AND MALLEABLE FITTINGS FOR IRON PIPE.

BLACK OR GALVANIZED, RIGHT OR LEFT HAND THREADS.



FIG. 25.

CLOSE NIPPLE.



FIG. 26.

SHOULDER NIPPLE.

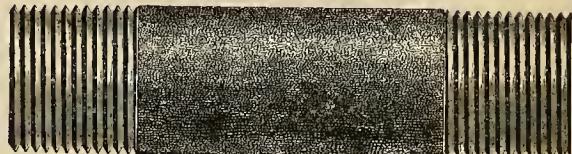


FIG. 27.

LONG NIPPLE.

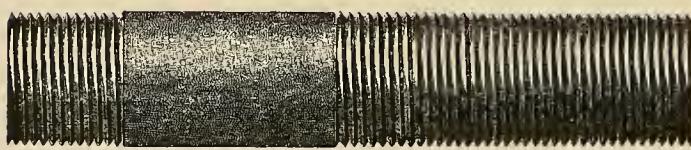


FIG. 28.

LONG SCREW NIPPLE.

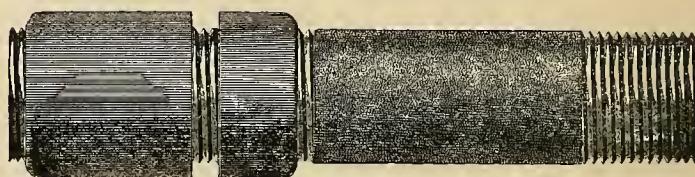


FIG. 29

LONG SCREW, WITH RUNNING SOCKET.

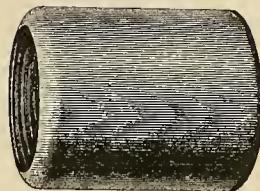


FIG. 30.

SOCKET OR COUPLING.



FIG. 31.

SOCKET, RIGHT AND LEFT.

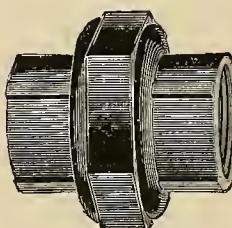
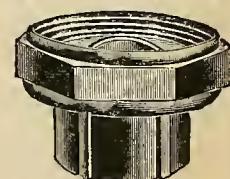
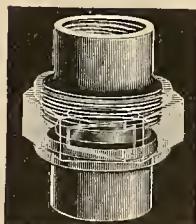
FEMALE HALF  
OR NUT AND SWIVEL.

FIG. 32.

MALLEABLE UNION.



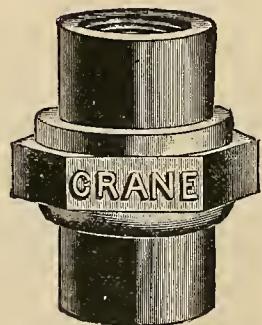
COMPOSITION SEAT.



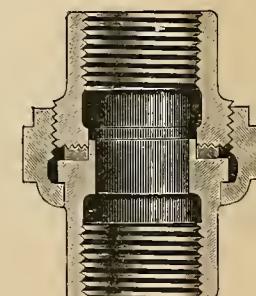
SECTION.

FIG. 33.

KEYSTONE UNION.



COMPOSITION GASKET.



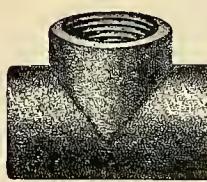
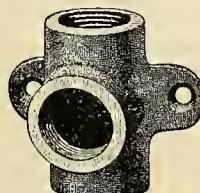
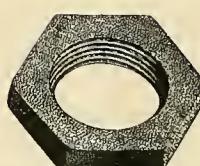
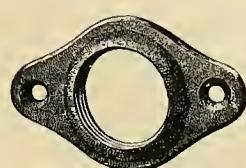
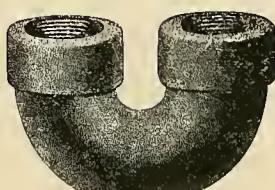
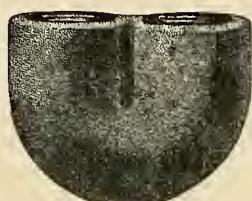
SECTION.

FIG. 34.

CRANE UNION.

## MALLEABLE FITTINGS—PLAIN.

BLACK OR GALVANIZED.

FIG. 35.  
ELBOW.FIG. 36.  
TEE.FIG. 37.  
CROSS.FIG. 38.  
CAP.FIG. 39.  
SIDE OUTLET ELBOW.FIG. 40.  
SIDE OUTLET TEE.FIG. 41.  
REDUCER.FIG. 42.  
PLUG.FIG. 43.  
DROP ELBOW.FIG. 44.  
DROP TEE.FIG. 45.  
BUSHING.FIG. 46.  
LOCKNUT.FIG. 47.  
EXTENSION PIECE.FIG. 48  
WASTE NUT.FIG. 49.  
RETURN BEND.  
OPEN.FIG. 50.  
RETURN BEND.  
CLOSE.

Full stock of Reducing Fittings, also Male and Female Drop Elbows, etc., etc.

## MALLEABLE FITTINGS—BEADED.

BLACK OR GALVANIZED.



FIG. 51.

ELBOW.

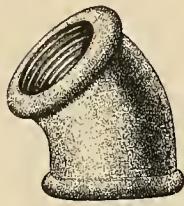


FIG. 52.

45° ELBOW.



FIG. 53.

STREET ELBOW.

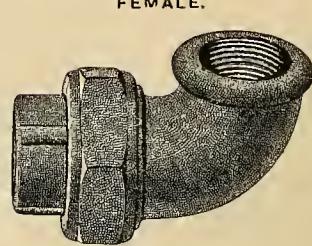


FIG. 54.

UNION ELBOW.

MALE ELBOWS TO ORDER.

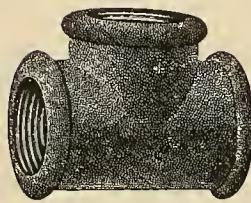


FIG. 55.

TEE.



FIG. 56.

CROSS.



FIG. 57.

REDUCER.

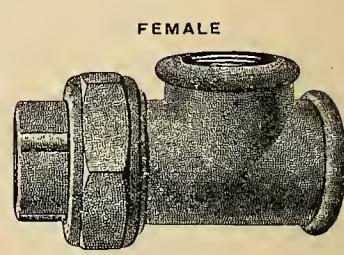


FIG. 58.

UNION TEE.

MALE TEES TO ORDER.

Full stock of Heavy Reducing Fittings.

## MALLEABLE RAILING FITTINGS.

SIZES  $\frac{1}{2}$  INCH TO 2 INCH INCLUSIVE.

FIG. 59.

ELBOW.

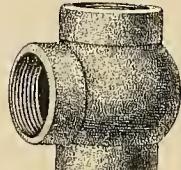


FIG. 60.

TEE.



FIG. 61.

CROSS.



FIG. 62

ORNAMENT.



FIG. 63.

SIDE OUTLET ELBOW.



FIG. 64.

SIDE OUTLET TEE.

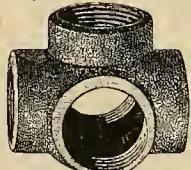


FIG. 65.

SIDE OUTLET CROSS.



FIG. 66.

C. I. RAILING FLANGE.

Brass Railing Fittings to order.

Fittings tapped left hand when so ordered.

Railings cut and fitted complete.

RAILINGS MADE OF IRON OR BRASS PIPE.

PLAIN OR NICKEL PLATED.

Suitable for enclosing Engines, Wheel Pits, Belts, Machinery, Offices, &c.

FIG. 67.

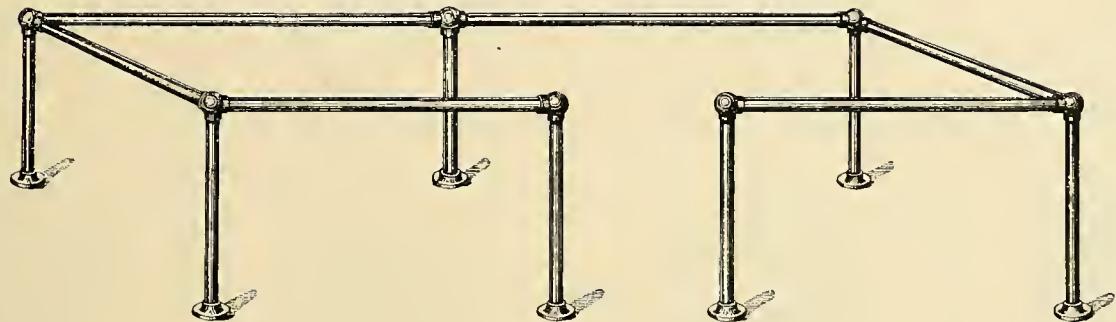


FIG. 68.

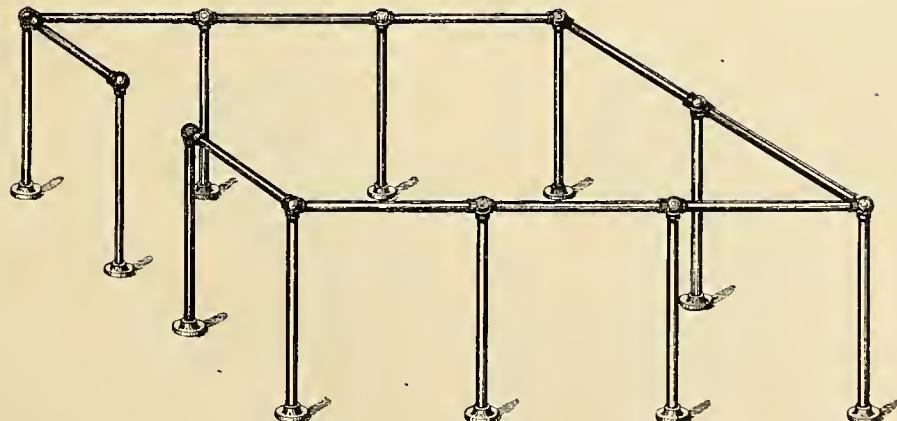
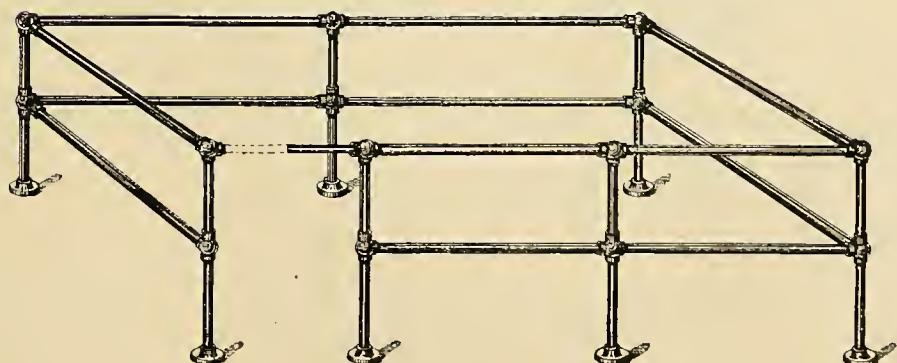


FIG. 69.



## CAST IRON FITTINGS.



FIG. 70.  
ELBOW.

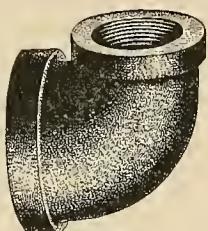


FIG. 71.  
REDUCING ELBOW.

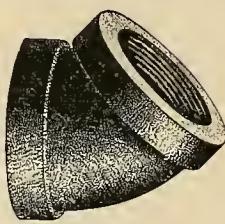


FIG. 72.  
45° ELBOW.



FIG. 73.  
SIDE OUTLET  
ELBOW.



FIG. 74.  
TEE.

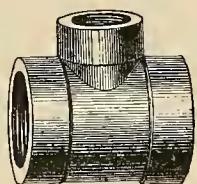


FIG. 75.  
TEE REDUCING  
ON OUTLET.

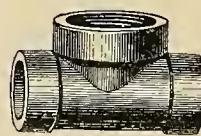


FIG. 76.  
TEE REDUCING  
ON RUN.



FIG. 77.  
SIDE OUTLET TEE.



FIG. 78.  
TEE REDUCING  
ON END.



FIG. 79.  
TEE REDUCING  
ON END AND OUTLET.



FIG. 80.  
CROSS REDUCING  
ON SIDE OPENINGS.

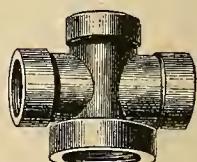


FIG. 81  
CROSS REDUCING  
ON END AND SIDE  
OPENINGS.



FIG. 82.  
CROSS.



FIG. 83  
RETURN BEND OPEN.

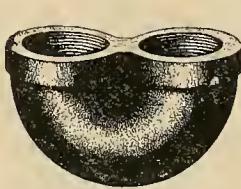


FIG. 84.  
RETURN BEND CLOSE.



FIG. 85.  
OPEN RETURN BEND  
WITH BACK OUTLET.

To read TEES correctly, always take measurements of run first, then outlet: 2 1, reads,  $2 \times 1 \times 1 \frac{1}{2}$ .

For Dimensions see Table, page 103.

## CAST IRON FITTINGS.



FIG. 86.



FIG. 87.



FIG. 88.



FIG. 89.

Y.

REDUCER.

BUSHING.

PLUG.



FIG. 90.

OFFSET.



FIG. 91.

CAP.

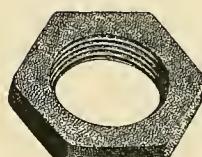


FIG. 92.

LOCKNUT.



FIG. 93.

PLUG,  
COUNTERSUNK  
HEAD.

FIG. 94.

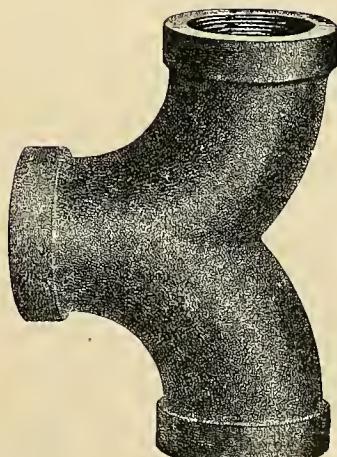
LONG SWEEP  
ELBOW.

FIG. 95.

LONG SWEEP  
DOUBLE ELBOW.

FIG. 96.

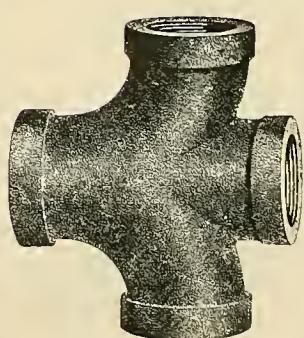
LONG SWEEP  
TEE.

FIG. 97.

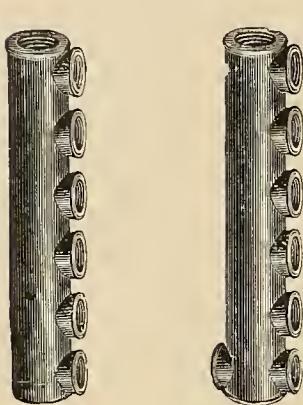
LONG SWEEP  
CROSS.

Long Sweep Elbows and Tees with Base, to order.

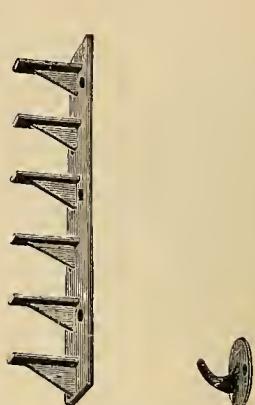
For Dimensions, See **Table, page 103.**

## CAST IRON FITTINGS.

## BRANCH TEES OR MANIFOLDS.

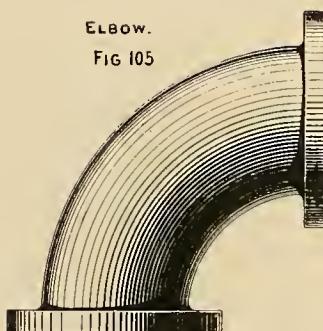
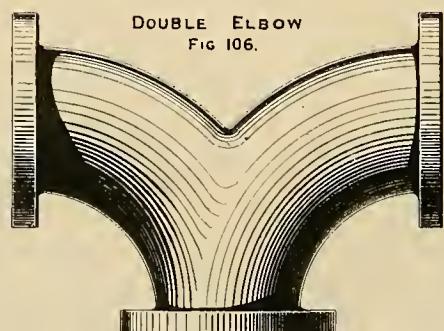
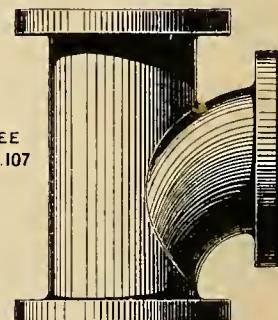
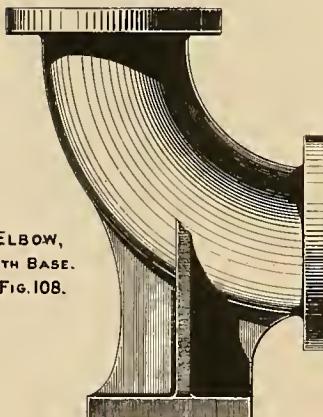
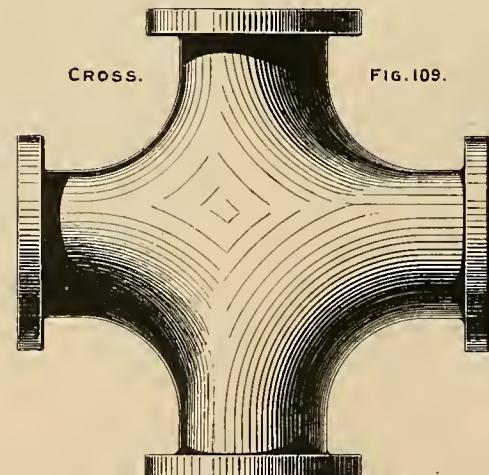
FIG. 98.  
PLAIN.FIG. 99.  
WITH BACK INLET  
ON END.FIG. 100.  
WITH BACK INLET  
IN CENTER.FIG. 101.  
COIL STAND.

## HOOK PLATES.

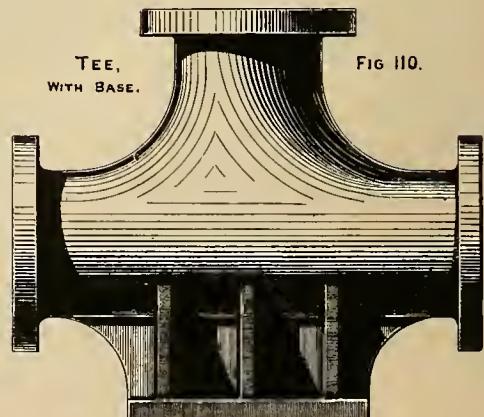
FIG. 102.  
PLAIN.FIG. 103.  
EXPANSION.FIG. 104.  
PLAIN SINGLE.

For dimensions see Table, page 103.

## LONG RADIUS FLANGED FITTINGS TO ORDER.

ELBOW.  
FIG 105DOUBLE ELBOW  
FIG 106.TEE  
FIG 107ELBOW,  
WITH BASE.  
FIG. 108.

CROSS.

TEE,  
WITH BASE.  
FIG 110.

For dimensions see Table, page 104.

## FLANGES.

MADE OF  
CAST IRON, CAST STEEL.

TO 30 IN. INTERNAL DIAMETER.

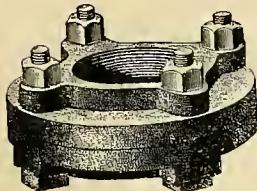
MADE OF  
WROUGHT IRON, ROLLED STEEL, OR BRASS.

FIG. 111.

FLANGED UNION.

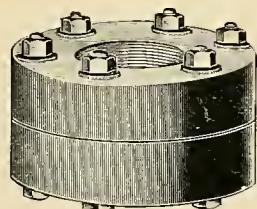


FIG. 112.

HYDRAULIC FLANGED UNION.

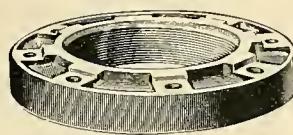


FIG. 113.

RAISED HOLE FLANGE.

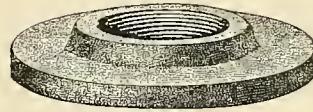


FIG. 114.

PLAIN FLANGE.

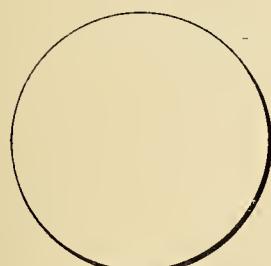


FIG. 115.

BLIND FLANGE.



FIG. 116.

CURVED FLANGE.

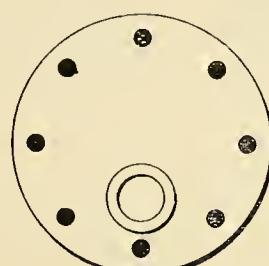


FIG. 117.

ECCENTRIC FLANGE.

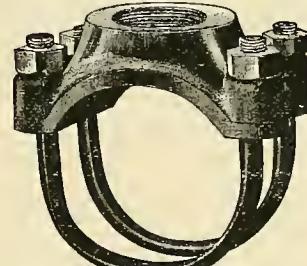


FIG. 118.

SADDLE.

FOR FULL DRAINING.

STEEL, MALLEABLE OR CAST IRON,  
DOUBLE OR SINGLE STRAP.

FIG. 119

FLANGES.

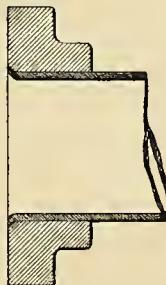


FIG. 120

HEAVY FLANGE.

MALE AND FEMALE

SHRUNK AND BEADED (for Steam.)



FIG. 121

LIGHT FLANGE.

SHRUNK AND BEADED (for Exhaust.)

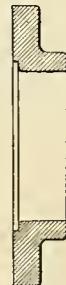


FIG. 122

COPPER PIPE FLANGE.



FIG. 123

STEEL OR WROT.  
FLANGE.  
FOR RIVETTING

FIG. 124

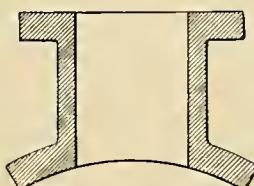
CAST IRON OR  
CAST STEEL FLANGE.  
FOR RIVETTING

FIG. 125

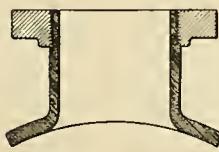
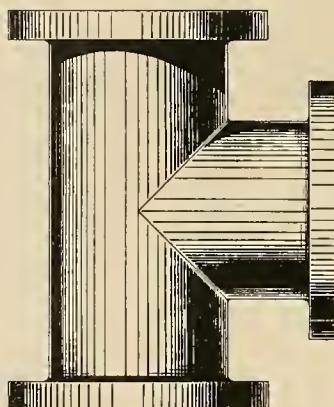
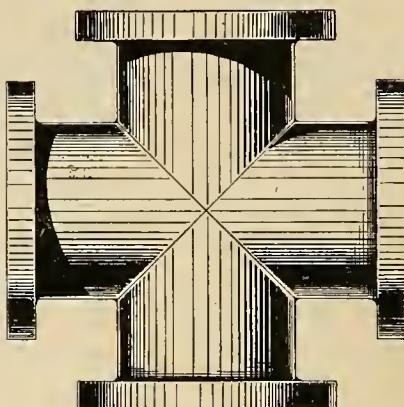
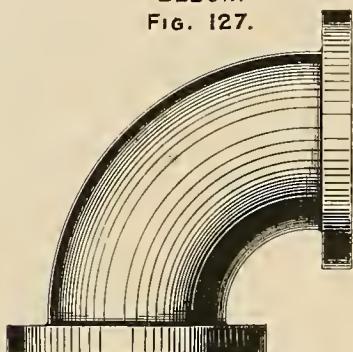
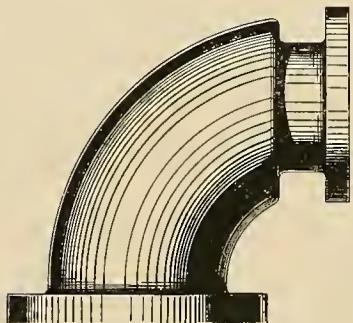
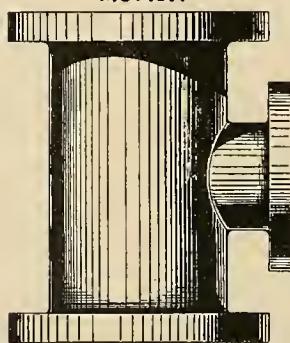
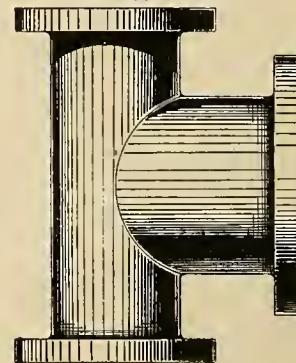
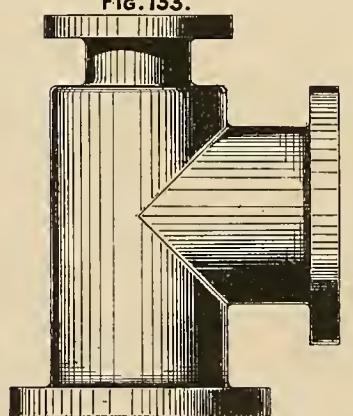
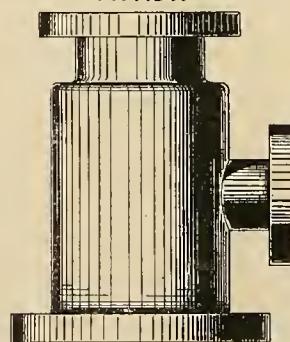
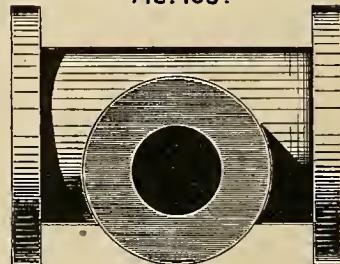
CAST IRON OR  
CAST STEEL NECK.

FIG. 126

STEEL OR WROT. NECK,  
WITH SCREWED FLANGE.

For Sizes and Dimensions see Table, pages 100 and 101.

## FLANGED FITTINGS.

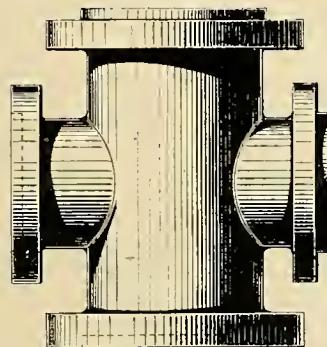
TEE.  
FIG. 128.CROSS.  
FIG. 129.ELBOW.  
FIG. 127.REDUCING ELBOW.  
FIG. 130.TEE.  
REDUCING ON OUTLET.  
FIG. 131.TEE.  
REDUCING ON RUN.  
FIG. 132.TEE.  
REDUCING ON END.  
FIG. 133.TEE.  
REDUCING ON END AND OUTLET.  
FIG. 134.ECCENTRIC TEE.  
FOR DRAINING STEAM LINES.  
FIG. 135.

Side Outlets on any of above and Recessed Joints to order.

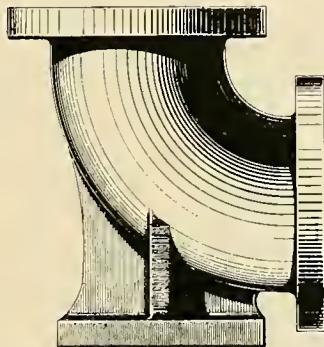
For sizes and dimensions see Table, pages 102 and 105.

## FLANGED FITTINGS.

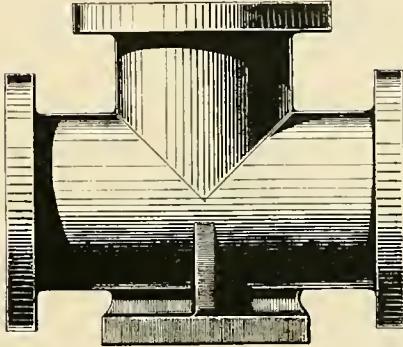
CROSS,  
REDUCING ON OUTLETS  
MALE AND FEMALE JOINTS.  
FIG. 136.



ELBOW,  
WITH BASE.  
FIG. 137.



TEE,  
WITH BASE.  
FIG. 138.



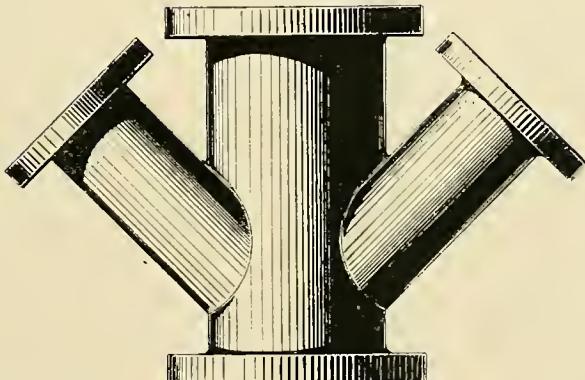
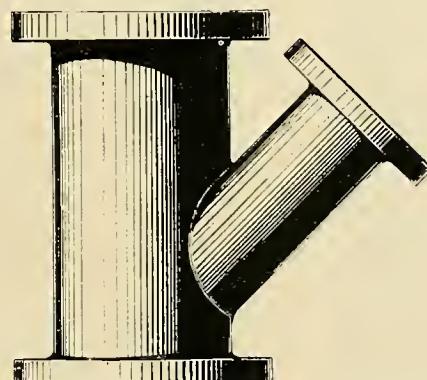
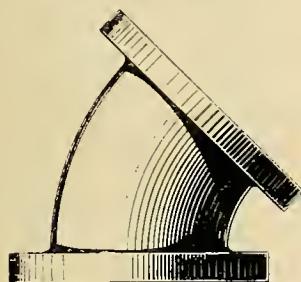
RECESSED JOINTS ON ALL FLANGED  
FITTINGS AND FLANGES WHEN SO  
ORDERED

Y,  
WITH REDUCING BRANCH.  
FIG. 140.

Y,

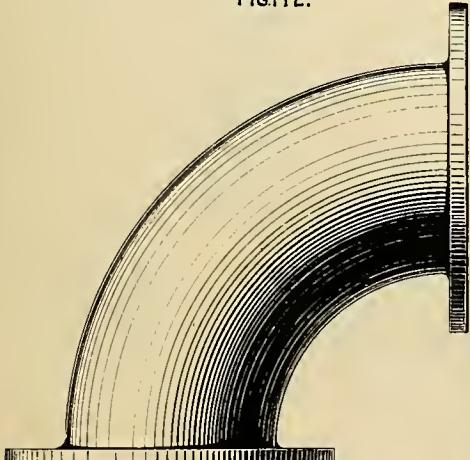
DOUBLE Y,  
WITH REDUCING BRANCHES.  
FIG. 141.

45° ELBOW.  
FIG. 139.

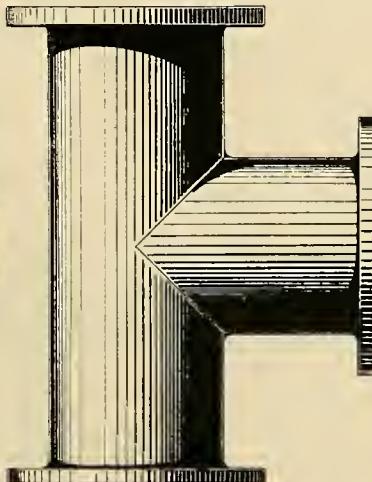


## LIGHT FLANGED FITTINGS FOR EXHAUST.

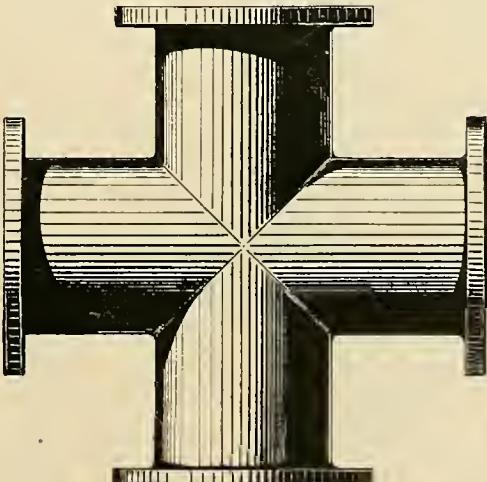
ELBOW.  
FIG. 142.



TEE.  
FIG. 143.



CROSS.  
FIG. 144.

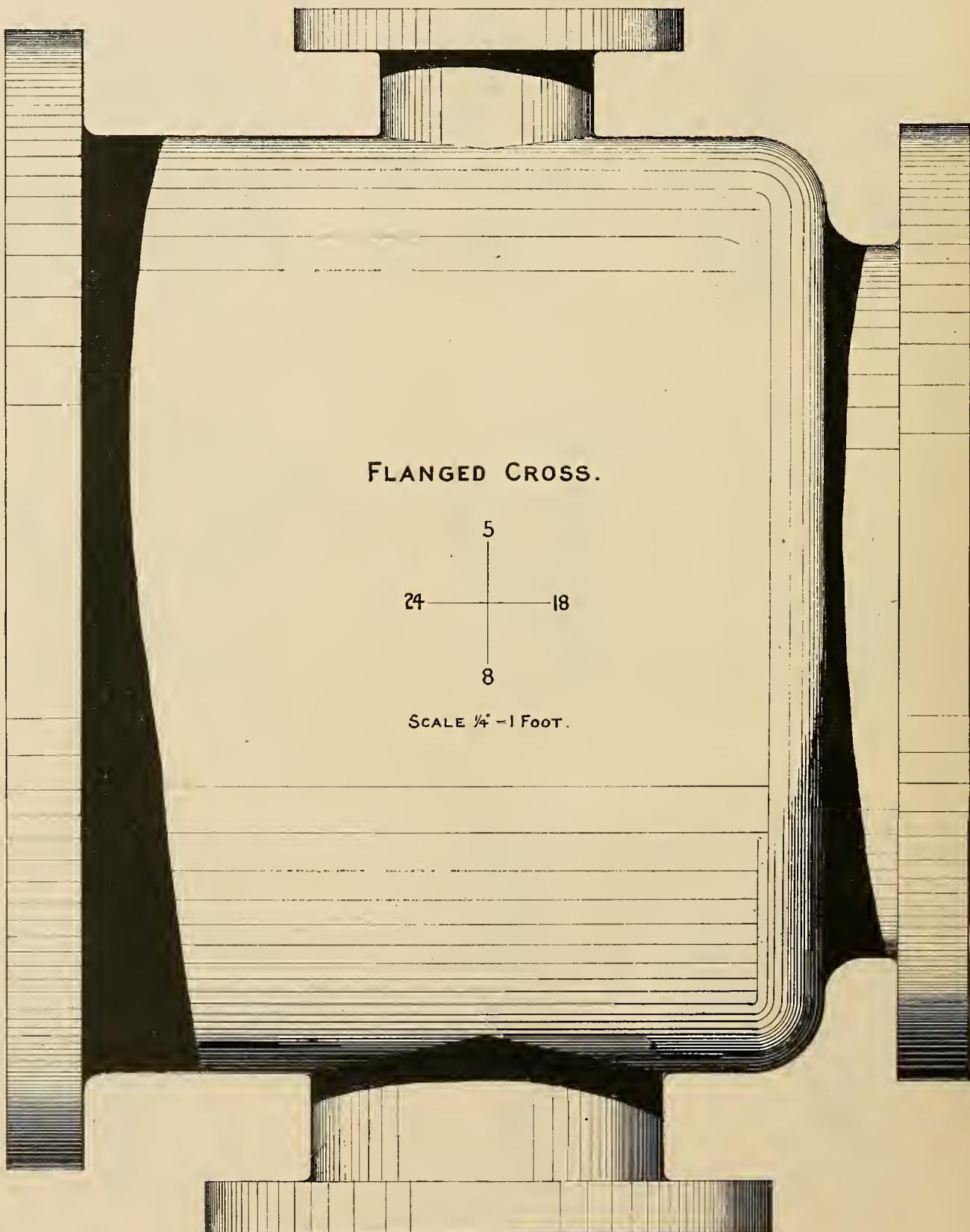


LIGHT REDUCING FITTINGS TO ORDER.

Side Outlets on any of above and Recessed Joints to order.

For sizes and dimensions see Table pages 102 and 105.

FIG. 145.



SPECIAL FITTINGS OF ANY SIZE TO ORDER.

## FULL SIZE SECTION OF

## HEAVY CAST IRON STEAM PIPE FLANGE,

For 16 Inch Outside Diameter Threaded Pipe.

Guaranteed Tight at 300 Lbs. Pressure.

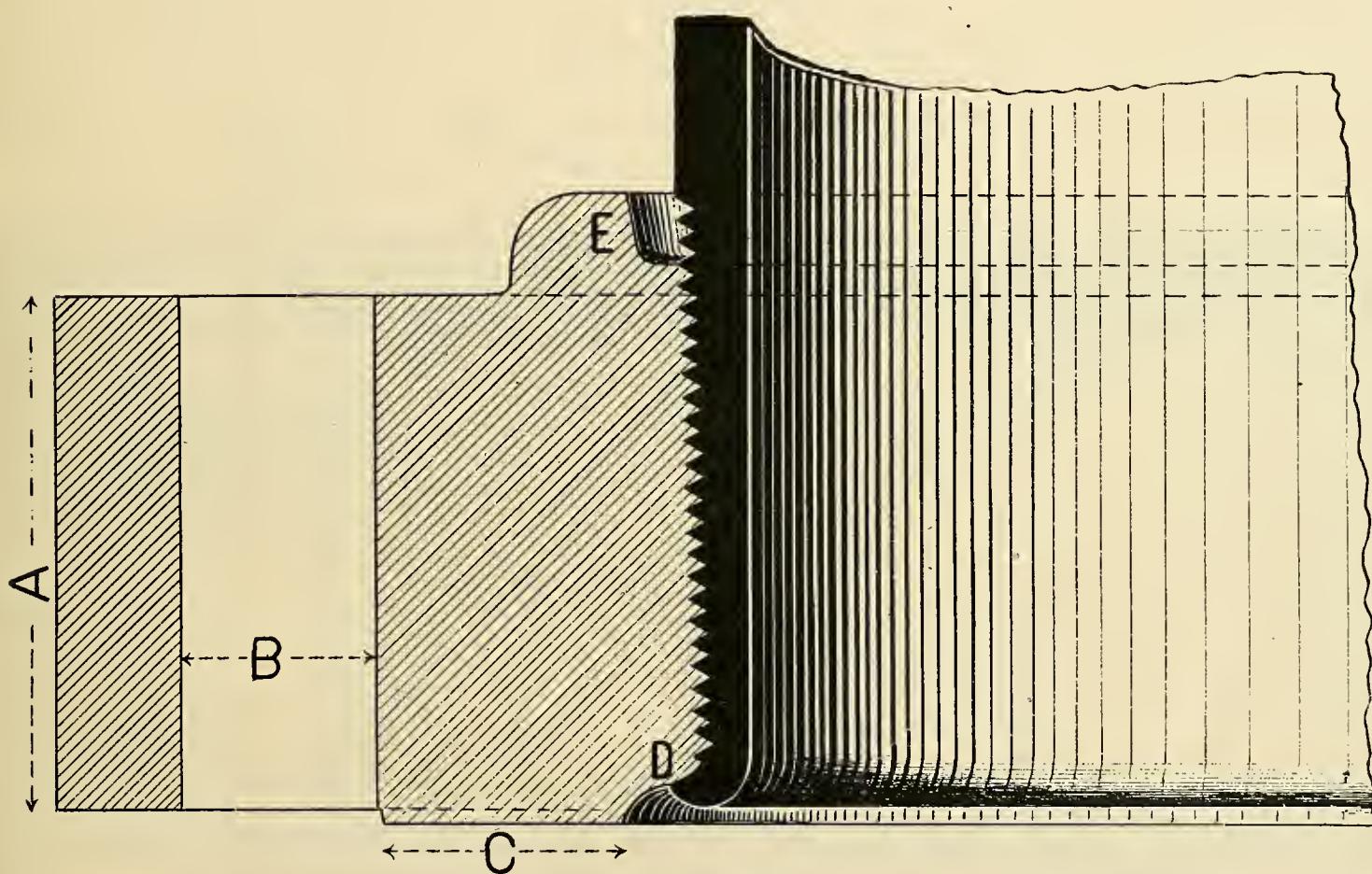


FIG. 146.

## NOTE THE SPECIAL ADVANTAGES OF THIS FLANGE:

- A—Thickness, giving strength and depth of thread.
- B—Large size and number of bolts. (See table pages 100 and 101.)
- C—Projection to receive gasket inside of bolt holes. This allows a greater pressure to bear on same than if gasket was distributed over entire face of flange.
- D—End of pipe turned and flared into groove on face of flange and then caulked. The flange is made tight by this means **entirely independent** of thread.
- E—Groove or pocket on back of flange to receive copper strip for caulking if ever required.

All size Steam Flanges are made in same proportion to the above of  
 CAST IRON or STEEL, WROUGHT IRON or ROLLED STEEL.

## THE PERFECT JOINT

## ROLLED STEEL FLANGE AND STEEL PIPE.

Welded Together by ELECTRICITY.

NO THREADS,	NO PIENING,	GUARANTEED ABSOLUTELY TIGHT AT	500 lbs. Pressure using Standard Pipe. 1000 " " " 2000 " " "	500 lbs. Pressure using Standard Pipe.
NO RIVETS,	NO CAULKING,			Ex. Heavy "
NO LEAKING.				Dbl. Ex. " "

TIGHT AS LONG AS THE PIPE LASTS.

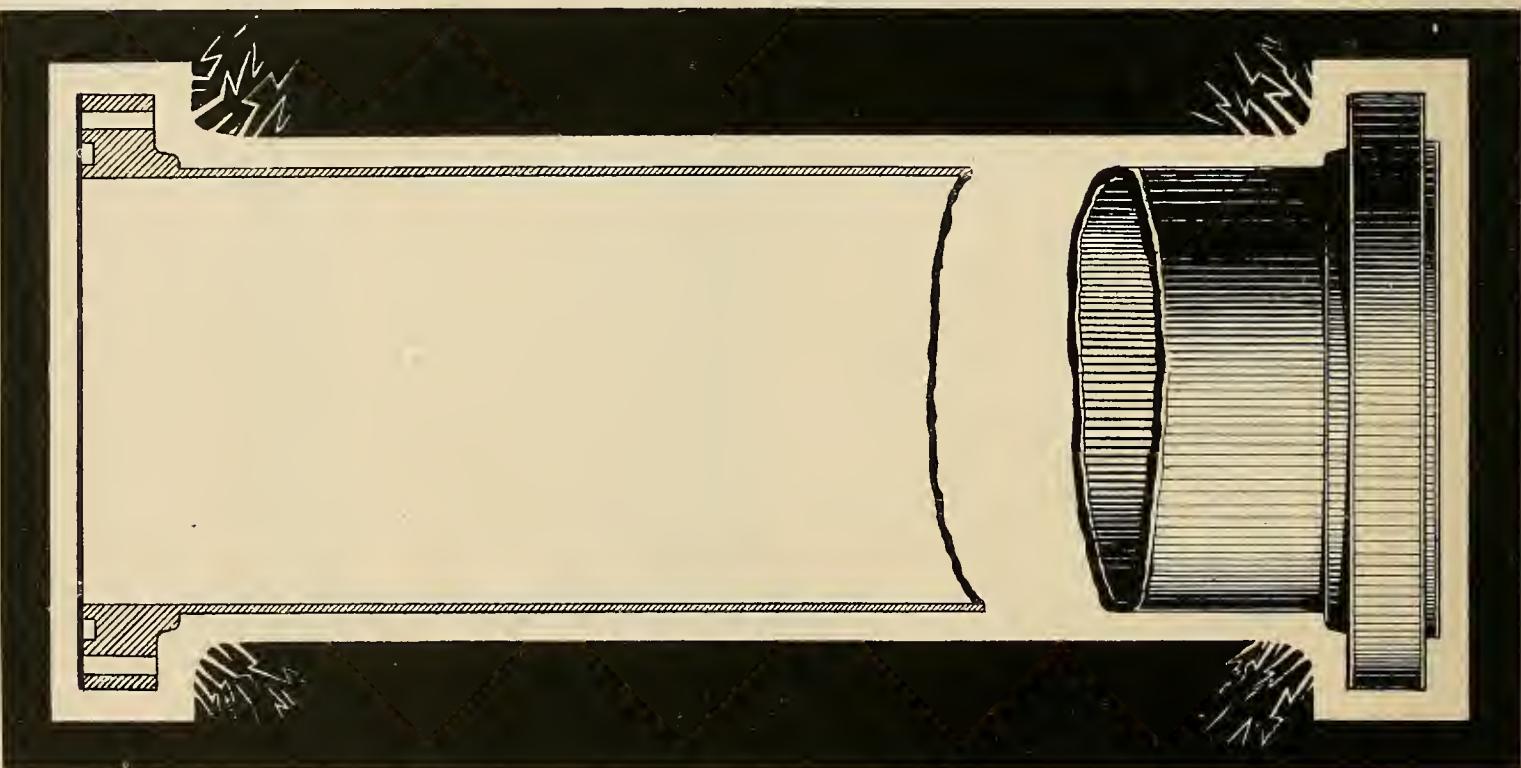


FIG. 147.

Engineers, Superintendents and Managers of High Pressure Steam Plants for Traction and Electric Light Purposes, Steel Mills, Blast Furnaces, Water Works, Paper and Pulp Mills, Sugar Refineries, Steamships, etc., have always felt the need of a **better method** of connecting large steam and hydraulic pipes and flanges together than threading, riveting or piening. This **difficulty is overcome** by welding these pieces together, thereby securing a joint that can be **depended upon absolutely**.

Rolled Steel Flanges Welded to Pipe of any size from 1 to 24 inches Diameter.

## BOWL FITTINGS FOR CAST IRON PIPE.

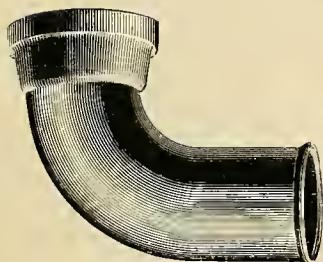


FIG. 148.  
ELBOW 90°.

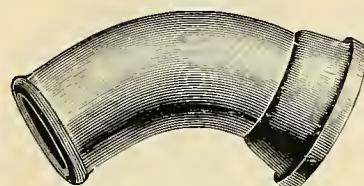


FIG. 149.  
ELBOW 45°.

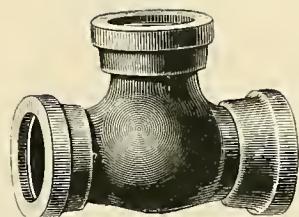


FIG. 150.  
TEE.  
BOWL ALL ENDS.

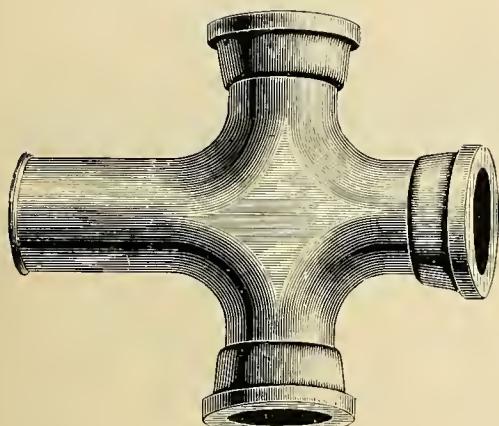


FIG. 151.  
CROSS.

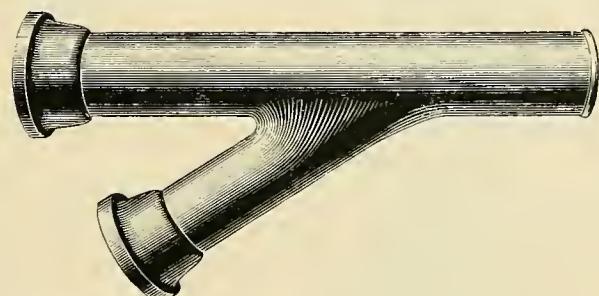


FIG. 152.  
V.

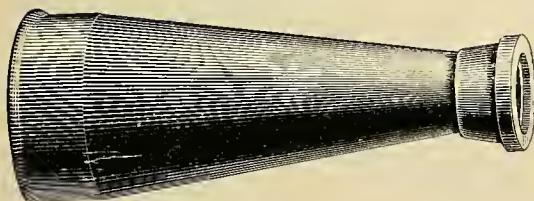


FIG. 153.  
REDUCER.

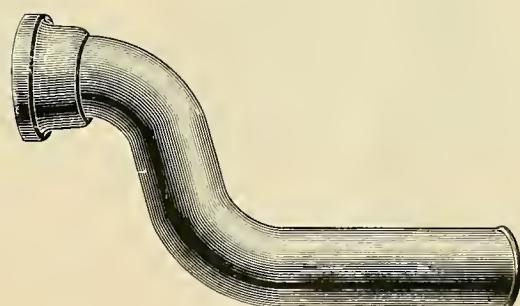


FIG. 152.  
OFFSET OR S.



FIG. 155.  
SLEEVE.

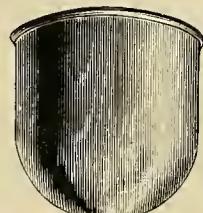


FIG. 156.  
PLUG.

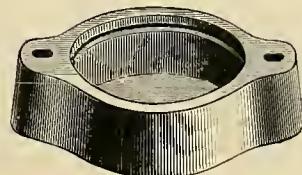


FIG. 157.  
CAP.

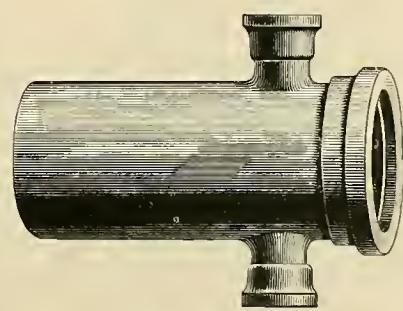
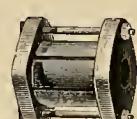
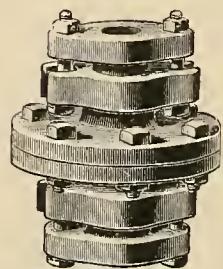
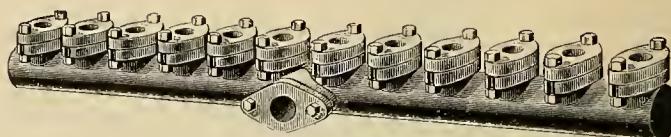
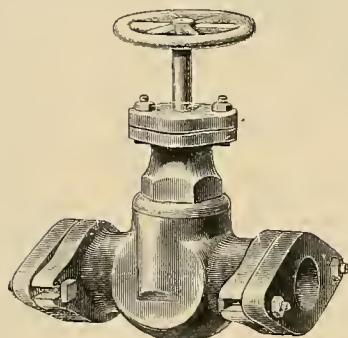
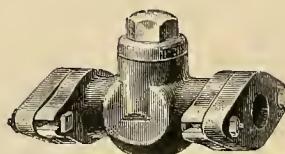
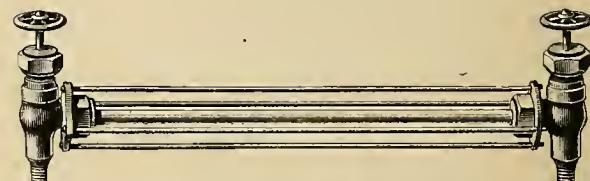
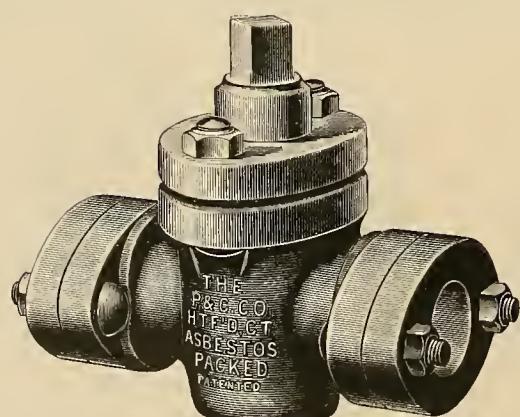
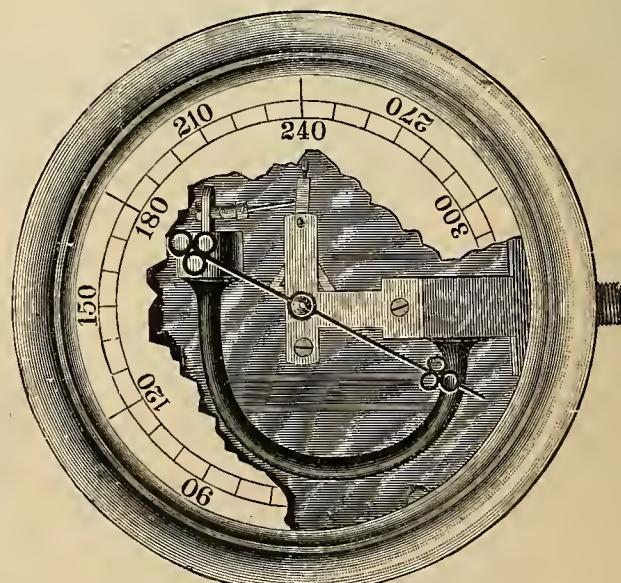


FIG. 158.  
DRIP BOX.

For Sizes and Weights, see Table, **page 106.**

## AMMONIA FITTINGS, VALVES, ETC.

FIG. 159.  
ELBOW.FIG. 160.  
TEE.FIG. 161.  
CROSS.FIG. 162.  
COUPLINGS.FIG. 163.  
RETURN BENDS.FIG. 164.  
FLANGED UNIONS.FIG. 165.  
STRAINERS.FIG. 166  
BRANCH TEE HEADER.FIG. 167.  
GLOBE AND ANGLE  
VALVES.FIG. 168.  
CHECK VALVES.FIG. 169.  
AUTOMATIC GAUGE.FIG. 170.  
AMMONIA COCK.  
ASBESTOS PACKED.FIG. 171  
AMMONIA GAUGE.

IRON BODY.

ANGLE VALVES.

BRASS MOUNTED.

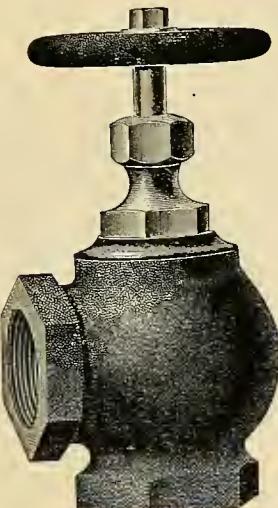


FIG. 172.  
SCREWED.  
FINISHED BRASS TOP

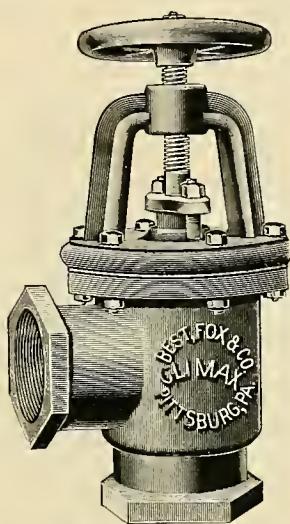


FIG. 173.  
CLIMAX HEAVY.  
ARCH TOP SCREWED

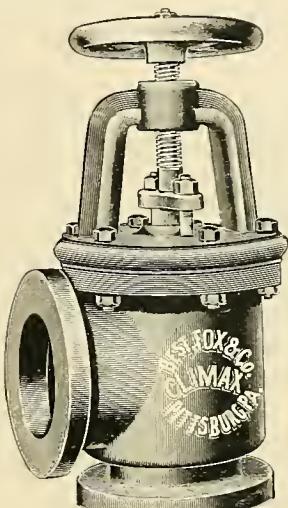


FIG. 174.  
CLIMAX HEAVY.  
ARCH TOP FLANGED

GLOBE VALVES.

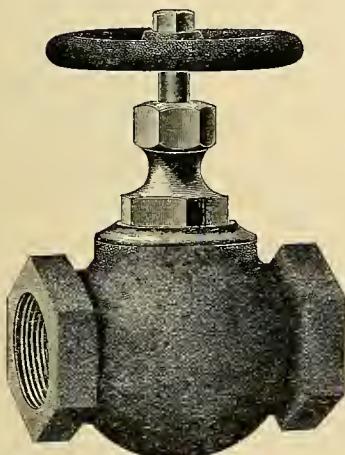


FIG. 175.  
SCREWED.  
FINISHED BRASS TOP

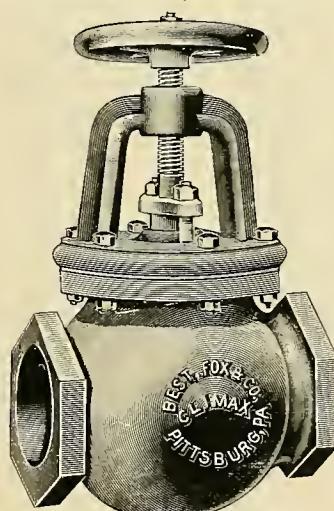


FIG. 176.  
CLIMAX HEAVY.  
ARCH TOP SCREWED

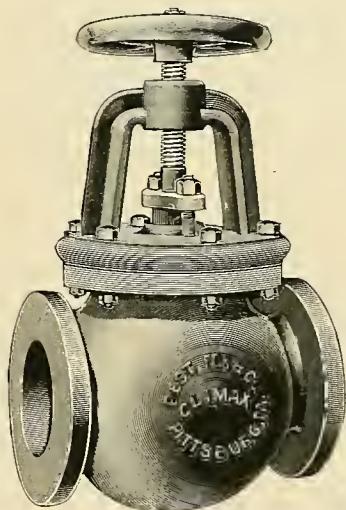


FIG. 177.  
CLIMAX HEAVY.  
ARCH TOP FLANGED

CHECK VALVES.

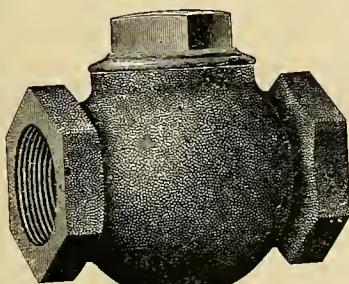


FIG. 178.  
GLOBE SCREWED

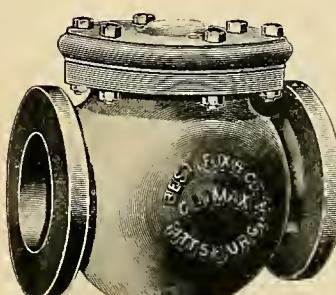


FIG. 179.  
CLIMAX HEAVY, GLOBE  
FLANGED.

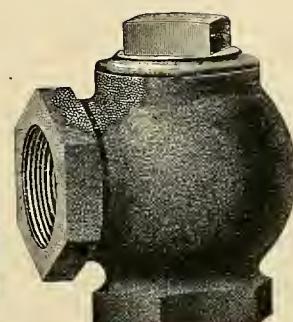


FIG. 180.  
ANGLE SCREWED.

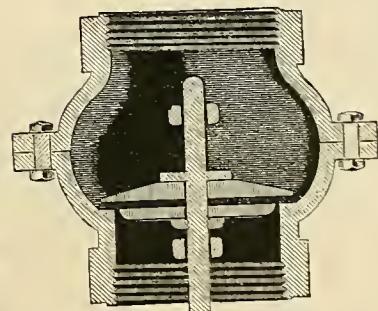
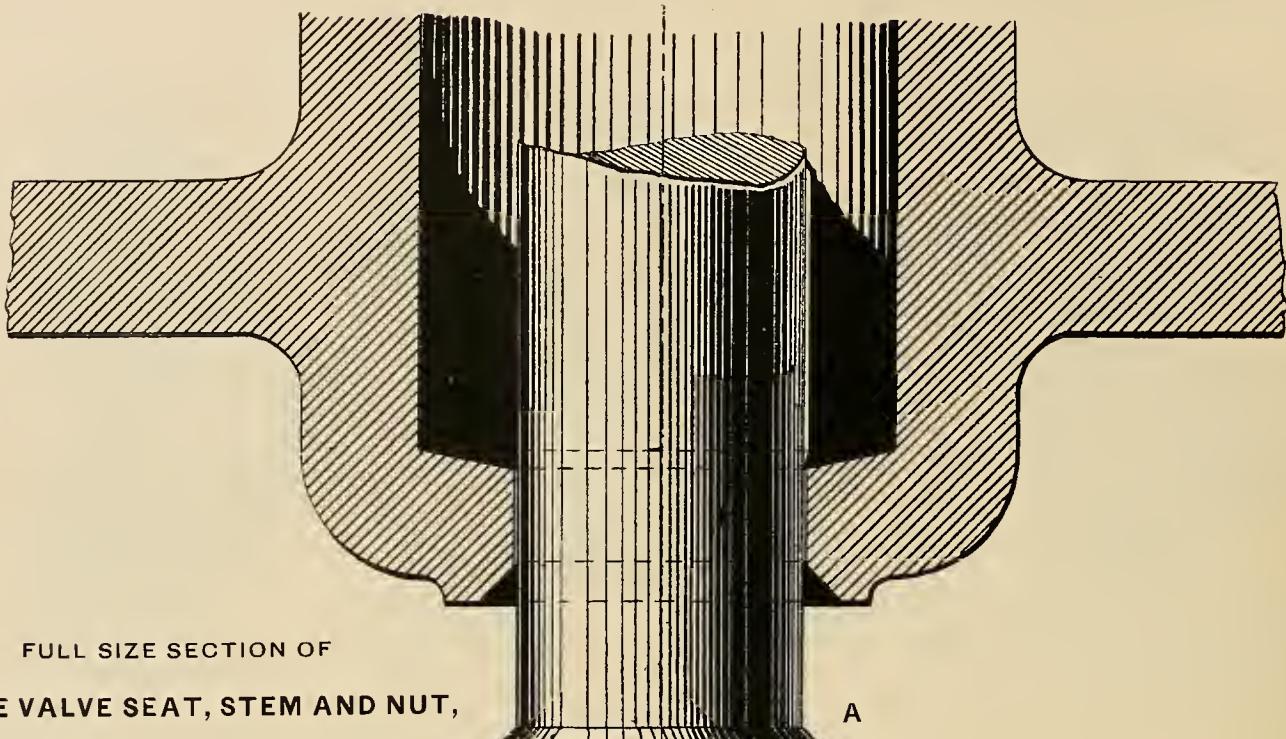


FIG. 181.  
VERTICAL SCREWED.  
(IN SECTION.)

For Sizes and Dimensions see Table pages 102 and 103.



With **Self-Packing Stem**, (see letter A) which seats into under side of top when valve is open.

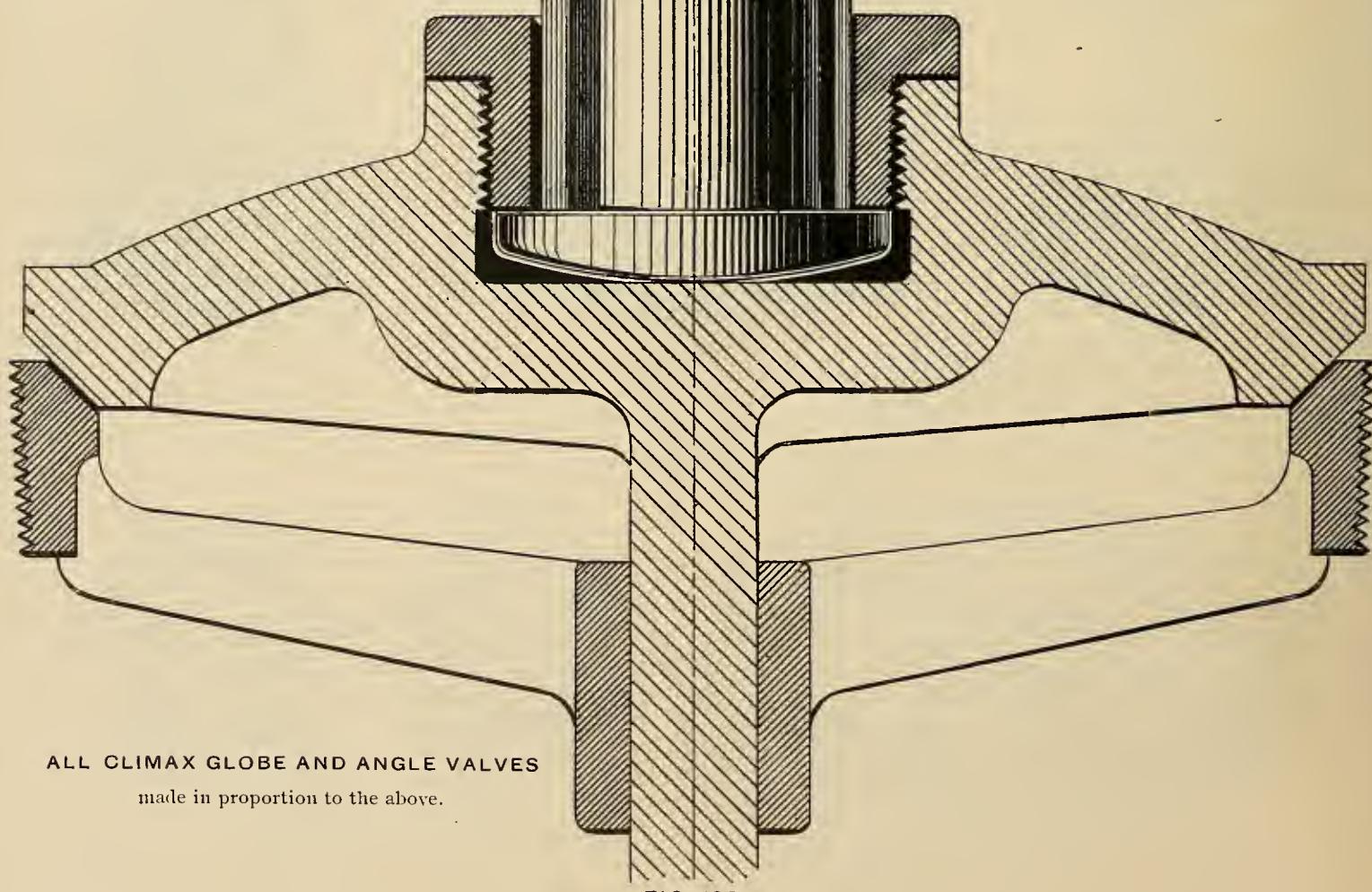


FIG. 182.

IRON BODY.

## SAFETY VALVES.

BRASS MOUNTED.

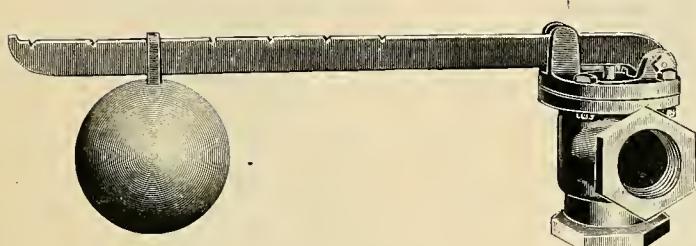


FIG 183.

CLIMAX.

ANGLE SCREWED.



FIG 184.

CLIMAX.

ANGLE FLANGED.

Three Way Climax Safety Valves to order.

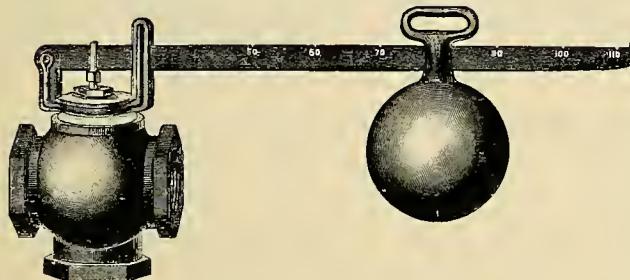


FIG 185.

STANDARD.

THREE WAY SCREWED.

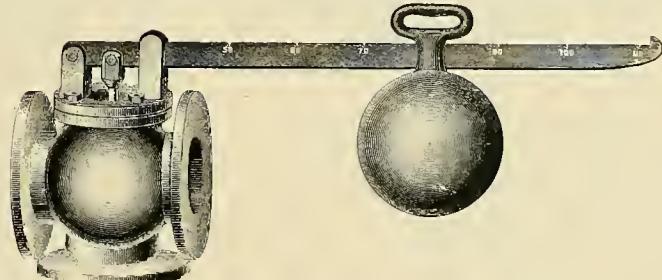


FIG 186.

STANDARD.

THREE WAY FLANGED.

Steam to Engines, etc., can be taken from these Safety Valves.

## SWINGING CHECK VALVES.

VALVES IN SAME ALL BRASS OR LEATHER FACE.

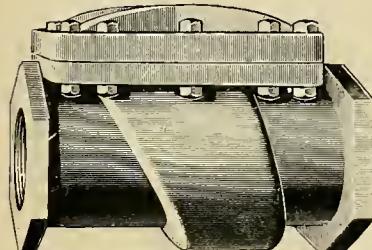


FIG 187.

SCREWED

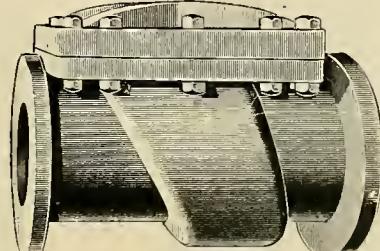


FIG 188.

FLANGED.

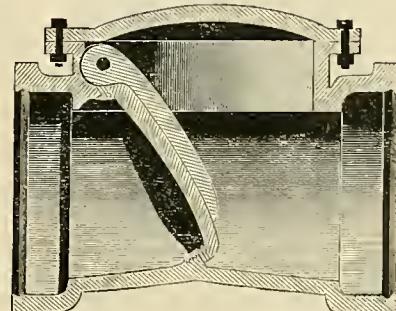


FIG 189.

BOWL OR HUB ENDS.

(IN SECTION.)

For Sizes and Dimensions see Table pages 102 and 103.

IRON BODY.

## JENKINS STEAM VALVES.

BRASS MOUNTED.

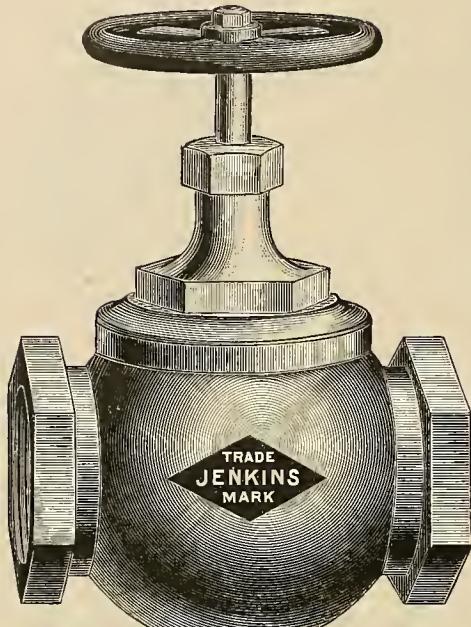


FIG. 190.

GLOBE VALVE SCREWED.

BRASS TOP FINISHED.

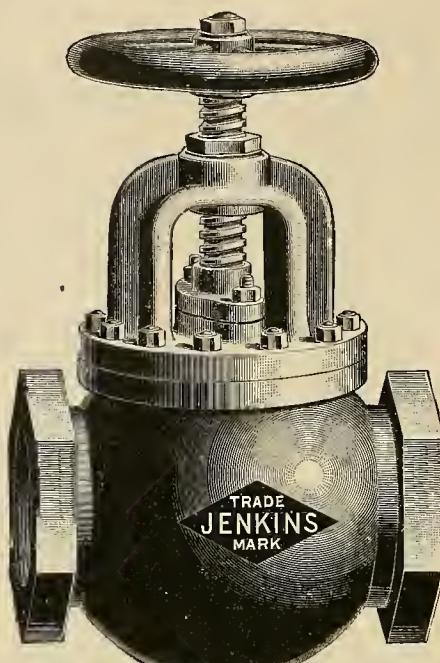


FIG. 191.

GLOBE VALVE SCREWED.

ARCH TOP.

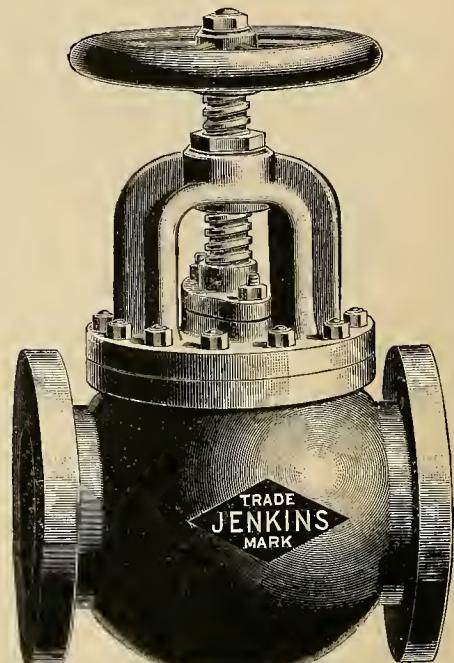


FIG. 192.

GLOBE VALVE FLANGED.

ARCH TOP.

IRON BODY.

## ASBESTOS STEAM VALVES.

BRASS MOUNTED.

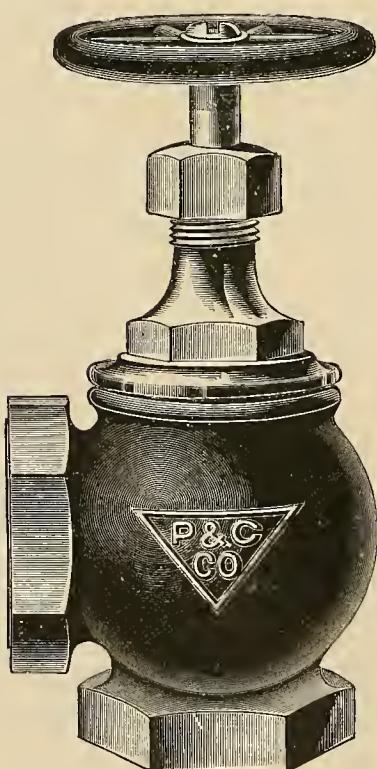


FIG. 193.

ANGLE SCREWED.

BRASS TOP FINISHED.

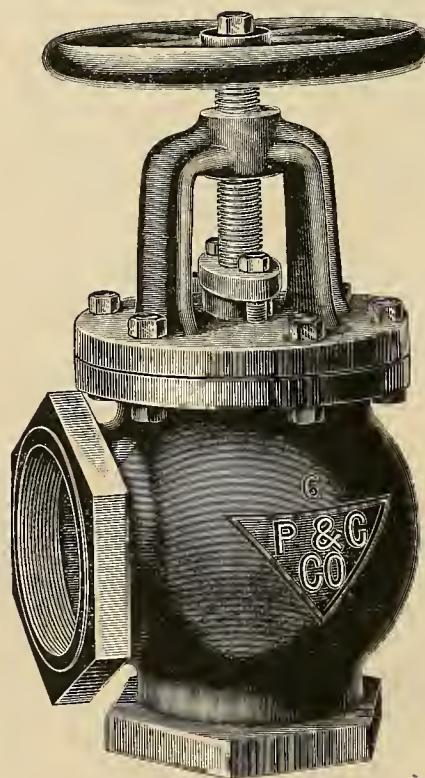


FIG. 194.

ANGLE SCREWED.

ARCH TOP.

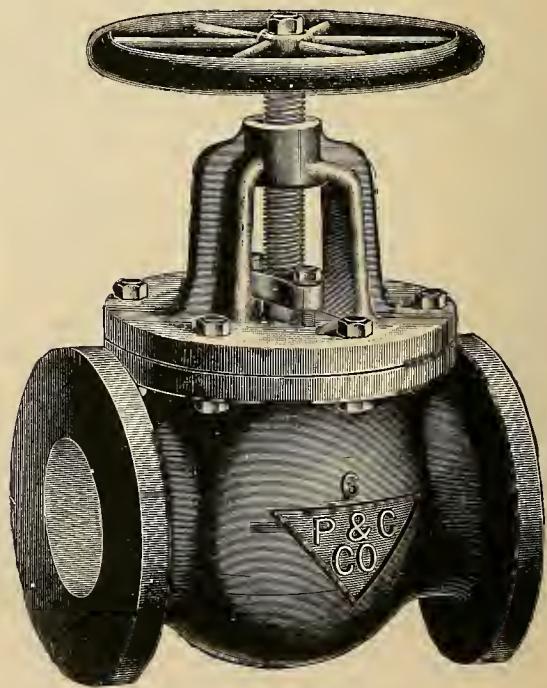


FIG. 195.

FLANGED.

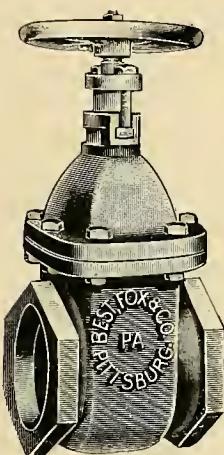
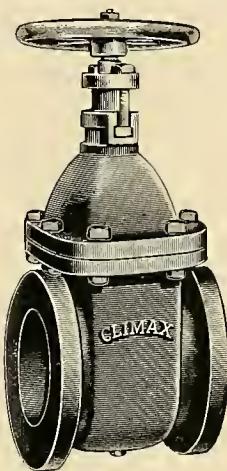
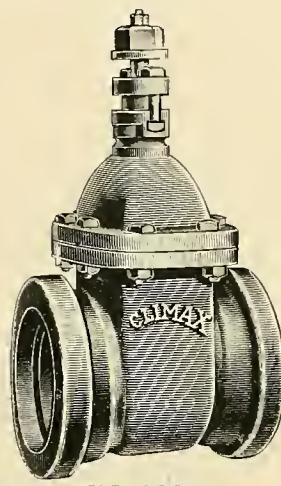
ARCH TOP.

Discs or Rings for Renewing Jenkins and Asbestos Valves of all sizes in stock.

IRON BODY.

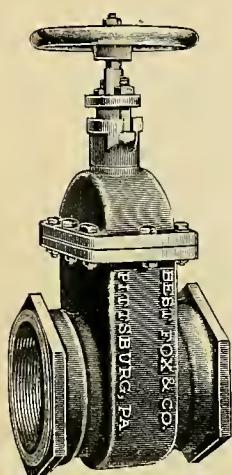
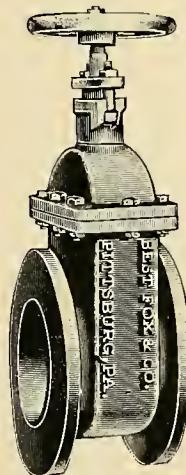
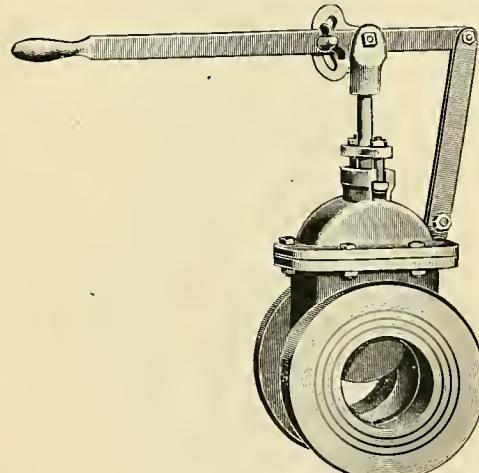
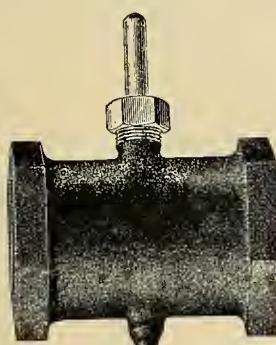
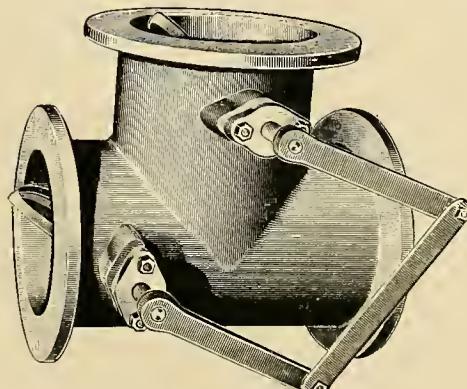
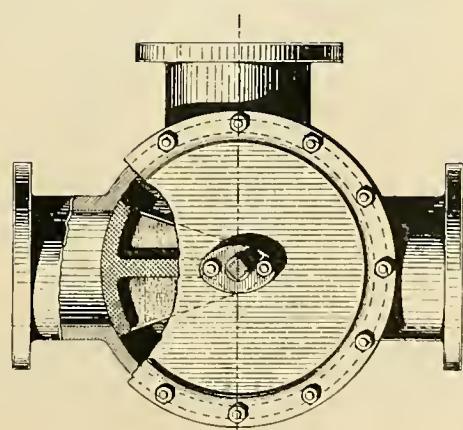
## CLIMAX GATE VALVES.

HEAVY FOR STEAM, WATER AND GAS.

BRASS MOUNTED  
OR ALL IRON.FIG. 196.  
SCREWED.FIG. 197.  
FLANGED.FIG. 198.  
BOWL OR HUB ENDS.

## LIGHT GATE VALVES.

FOR EXHAUST.

FIG. 199.  
SCREWED.FIG. 200.  
FLANGED.FIG. 201.  
SCREWED OR FLANGED.  
QUICK OPENING.FIG. 202.  
BUTTERFLY VALVE.  
SCREWED OR FLANGED.FIG. 203.  
DOUBLE BUTTERFLY VALVE.  
FLANGED.FIG. 204.  
TRANSFER VALVE.  
FLANGED

For Sizes and Dimensions see Table, pages 102, 103 and 104.

SECTIONS OF  
**DOUBLE DISC GATE VALVES**  
 WITH  
**REMOVABLE BRONZE SEATS.**

**Heavy**—Guaranteed tight at 200 lbs. Pressure.

**Ex. Heavy** — " " " 600 " "

**Hydraulic** — " " " 1000 " " or over.

**CLIMAX.**

INSIDE SCREW.  
 STRAIGHT FACE

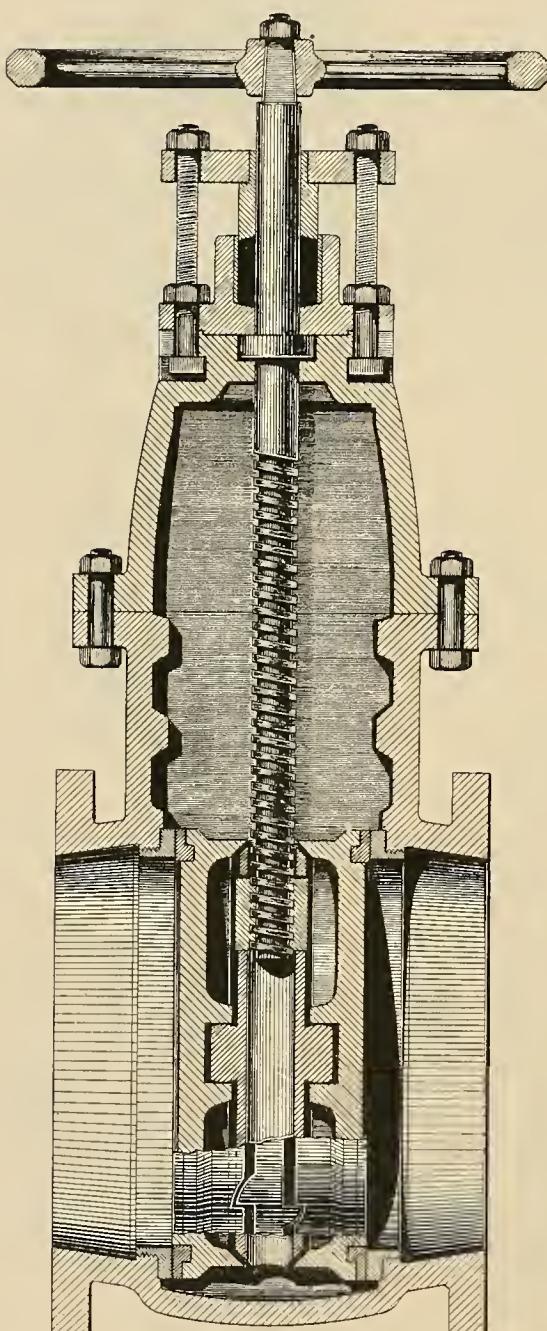


FIG. 205.

Made also with outside screw.

**BESTS PATENT DUPLEX.**

OUTSIDE SCREW AND YOKE, SELF PACKING STEM  
 With removable and interchangeable Bronze Seats.  
 Tested to 600 lbs. Pressure.

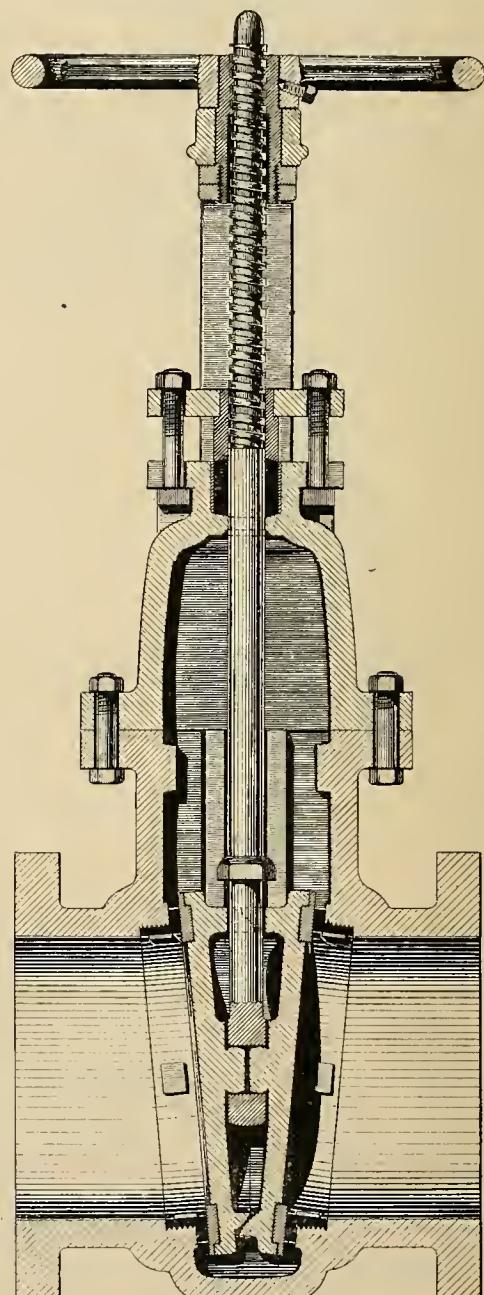


FIG. 206.

Made also with inside screw.

For sizes and dimensions see Table page 102.

**FIG. 205**, on opposite side, illustrates a section of our

**Climax Double Disc Gate Valve,  
WITH = = = = =  
Removable Bronze Seats,**

Iron Body, Brass Mounted, made in sizes from  $2\frac{1}{2}$  to 24 inches inclusive, either screwed, flanged or bowl ends.

The construction of this valve is such that the eccentrics on center ring or wedge bear on back of discs close to the **outer edge** of same. This insures a tight valve, as there can be no springing of discs, as is the case when wedging takes place from the centre only. This valve will **not stick**, but **works freely** at all times and **in any position**.

**FIG. 206**, on opposite side, illustrates a section of

**Best's Patent Duplex Wedge Gate Valve,  
WITH = = = = =  
Removable Bronze Seats,**

Iron Body, Brass Mounted, made in sizes from  $2\frac{1}{2}$  to 24 inches inclusive, either screwed, flanged or bowl ends.

This valve is similar to Fig. 205, except wedge disc is made in two parts, and admits of adjustment not obtained with single disc valve, and the strength of discs is not impaired by making same in two pieces. Bronze or steel spindles are made as desired; valves are also made with or without by-pass, using cock, gate or globe valves in by-pass connection. Valves made with or without outside screw.

## BEST'S PATENT

## SINGLE DISC, EXTRA HEAVY GATE VALVE

WITH

Removable Bronze Seats (that are interchangeable)

Self-Packing Stem—Outside Screw and Yoke.

Ribbed Body or Plain, with or without by-pass.

Tested to 600 lbs. pressure.

## SECTION

"BEST'S PATENT" EXTRA HEAVY.

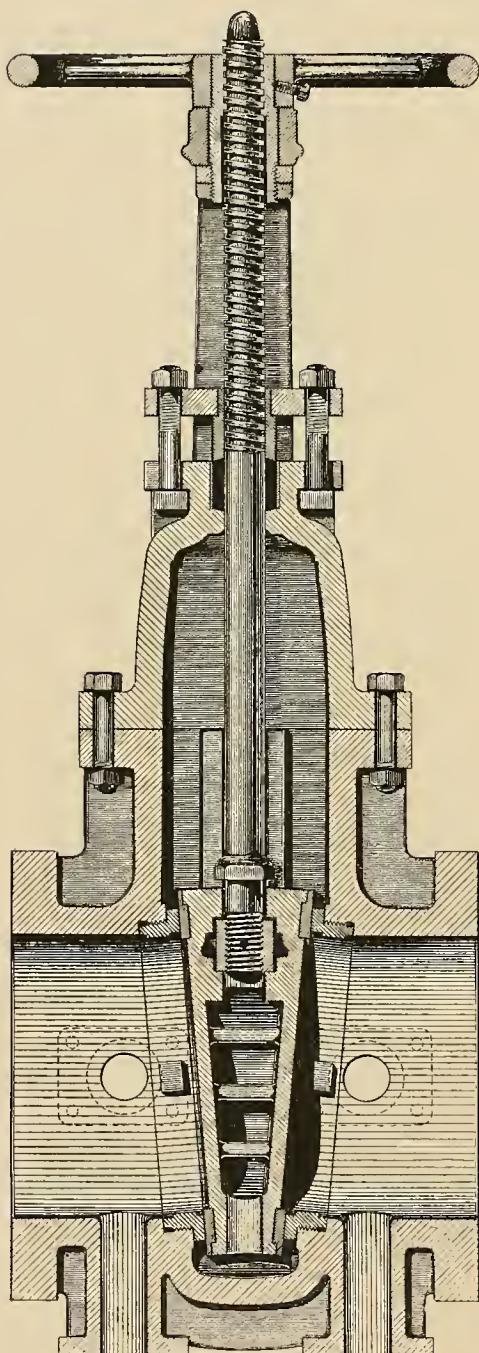
OUTSIDE SCREW AND YOKE.  
BY-PASS ON BOTTOM OR SIDE.

FIG. 207.

"BEST'S PATENT" EXTRA HEAVY.  
WITH BY-PASS ON BOTTOM AND 3-WAY  
COCK IN BY-PASS.

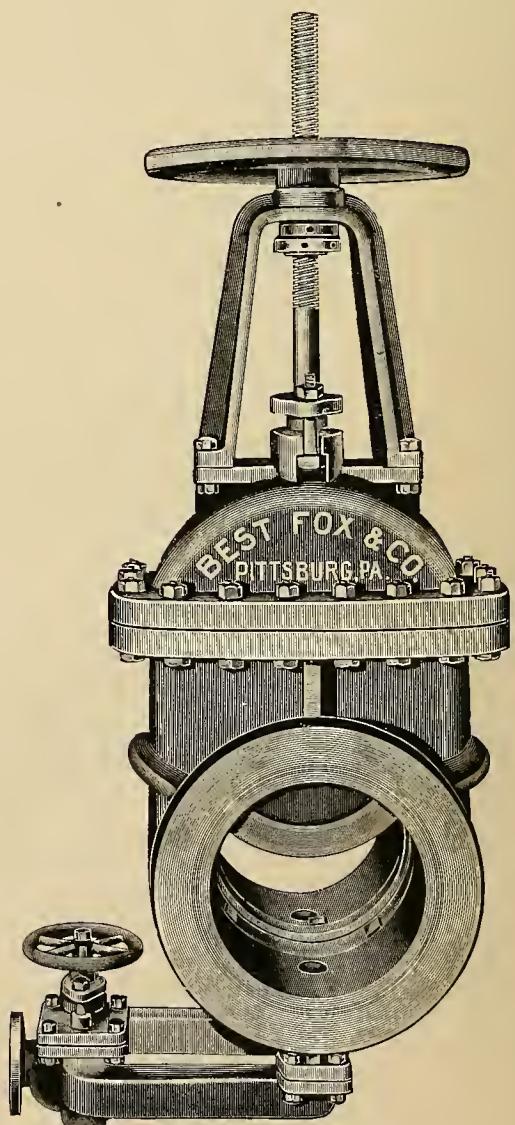


FIG. 208.  
Made also with inside screw.

For sizes and dimensions see Table page 102.

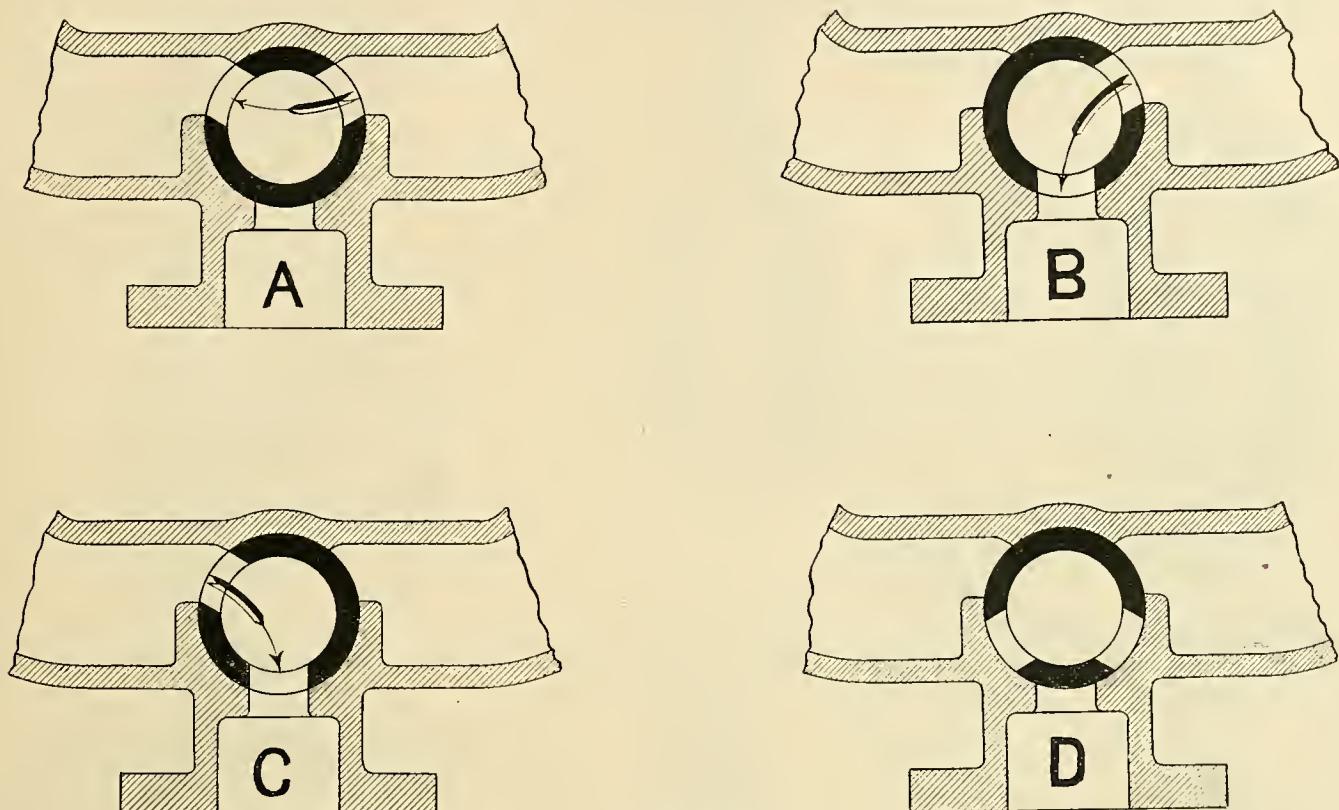


FIG. 209.  
TESTED to 600 lbs. Pressure.

On the opposite side we show section and outside elevation of

### BEST'S PATENT EXTRA HEAVY WEDGE GATE VALVE

with Renewable Bronze Seats, (that are interchangeable) **Self-Packing Stem**, outside screw and yoke made with or without by-pass. (Note also Fig. 206.)

To meet the large demand for a tight and reliable Gate Valve suitable for Extra Heavy Steam Pressure we have made a special line of patterns from  $2\frac{1}{2}$  to 24 inches, having seats that are *readily* removed when necessary, and others inserted in their place and valve be as tight as originally. Disc is faced with bronze, stem made of bronze (or steel, if desired) and gland lined with bronze.

#### NOTE

The draining feature combined with our by-pass: Three-way cock with brass plug and packing gland is used for this purpose and warranted to work free and easy at all times and not leak.

With key in position as shown in A—Steam is passed to either side of disc.

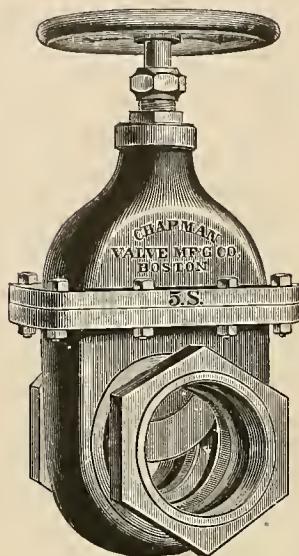
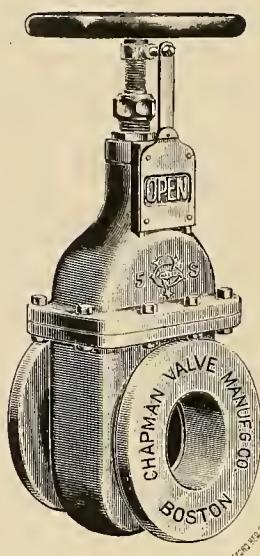
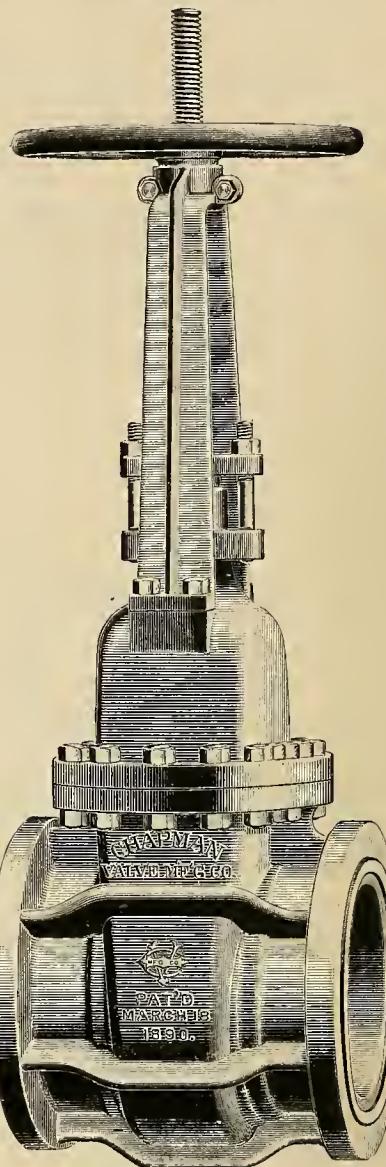
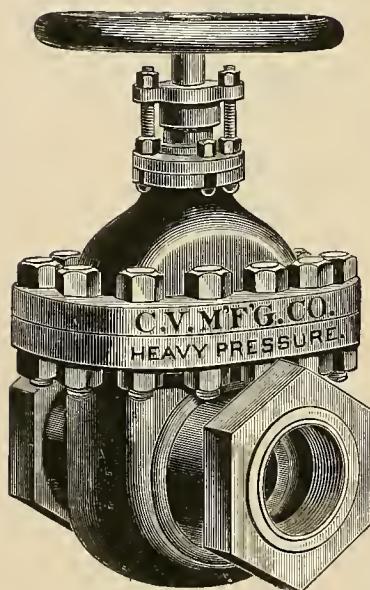
B—Water is drained from right side of disc.

C—Water is drained from left side of disc.

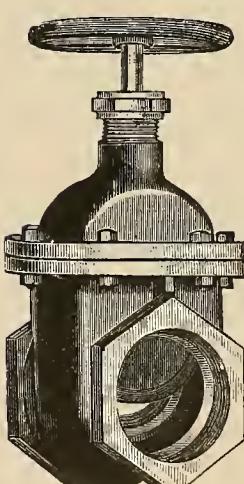
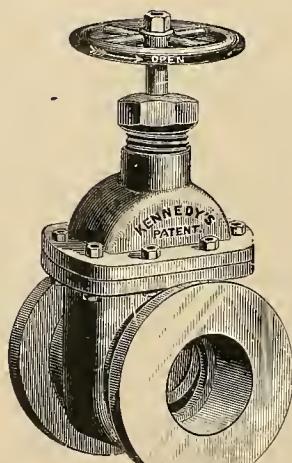
D—By-pass and drains closed.

By-pass has only 2 joints where branches connect to body of valve. Gate or Globe can be used in place of cock if so desired and draining feature is not required. By-pass connection made on bottom or side.

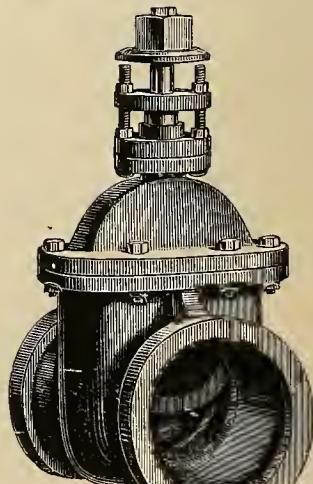
IRON BODY. CHAPMAN GATE VALVES. BRASS MOUNTED

FIG. 210.  
SCREWED.FIG. 211.  
FLANGED.  
WITH INDICATOR.FIG. 212.  
ARCH TOP.  
FOR HEAVY PRESSURE.FIG. 213.  
SCREWED.  
FOR EXTRA HEAVY PRESSURE.FIG. 214.  
FLANGED.  
FOR EXTRA HEAVY PRESSURE.

IRON BODY. KENNEDY GATE VALVES. BRASS MOUNTED.

FIG. 215.  
SCREWED.

DESCRIPTIVE CIRCULAR ON APPLICATION.

FIG. 217.  
OWL OR HUB  
ENDS.

## FAIRBANKS GATE VALVES.

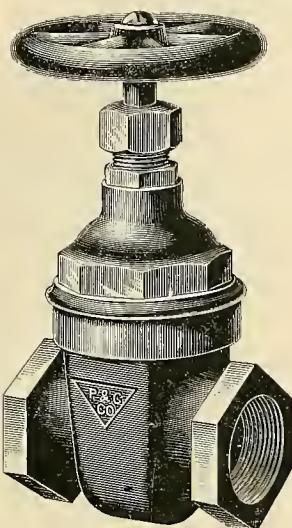


FIG. 218.

ALL BRASS ASBESTOS DISC.  
SCREWED OR FLANGED.

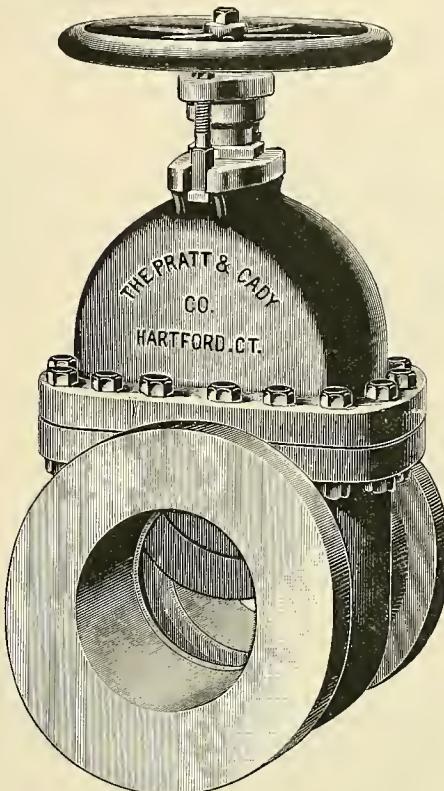


FIG. 219.

IRON BODY ASBESTOS DISC.  
SCREWED OR FLANGED.

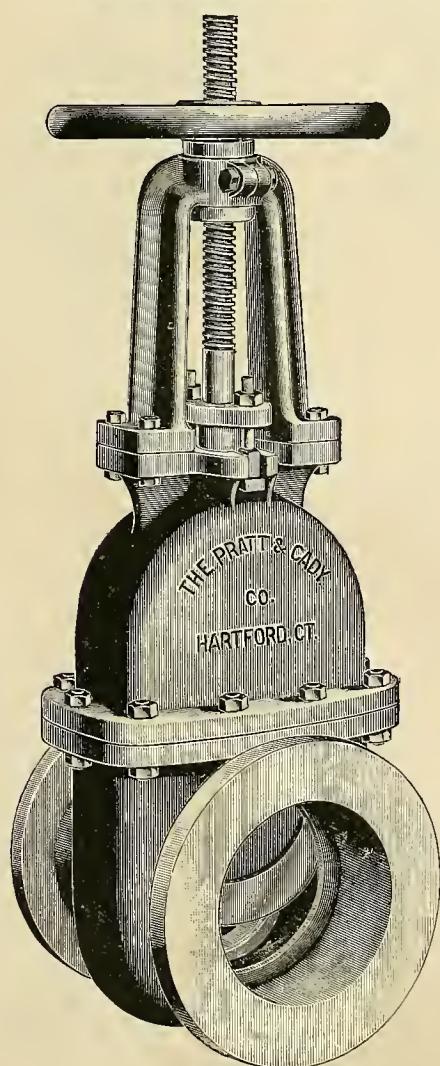


FIG. 220.

IRON BODY FLANGED.  
REMOVABLE BRONZE SEAT—ARCH TOP.

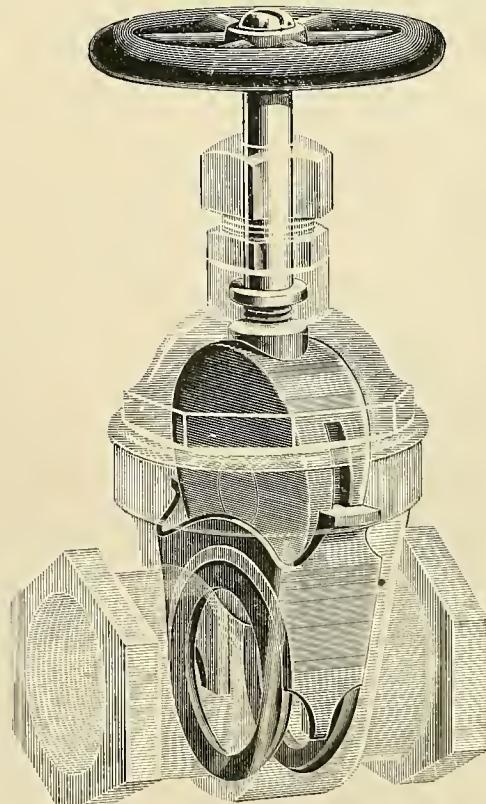


FIG. 221.

IRON BODY SCREWED.  
REMOVABLE BRONZE SEAT—SCREWED BONNET.

Descriptive Circular on Application.

IRON COCKS  
WITH IRON OR BRASS PLUGS.

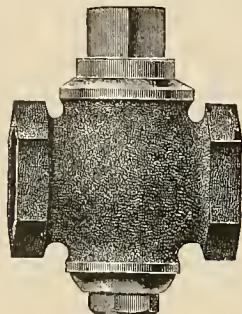


FIG. 222.  
SCREWED.  
SQUARE HEAD.

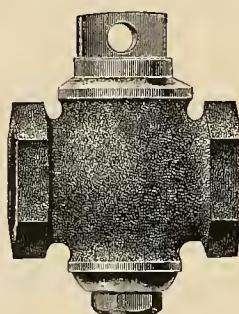


FIG. 223.  
SCREWED.  
FLAT HEAD.

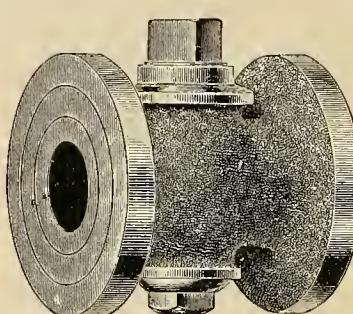


FIG. 224.  
FLANGED.  
SQUARE OR FLAT HEAD

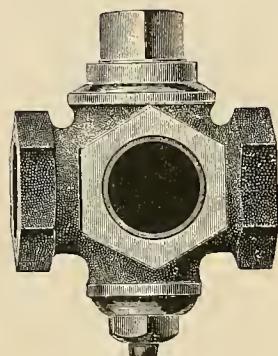


FIG. 225.  
THREE-WAY.  
SCREWED OR FLANGED.

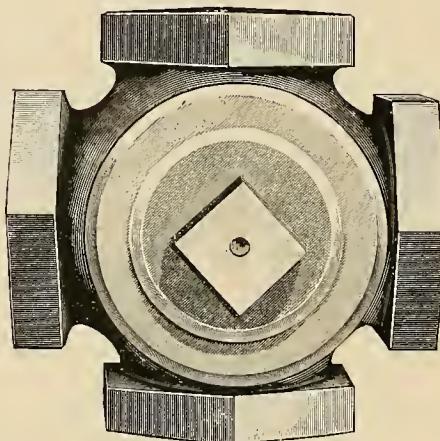


FIG. 226.  
FOUR-WAY.  
SCREWED OR FLANGED.

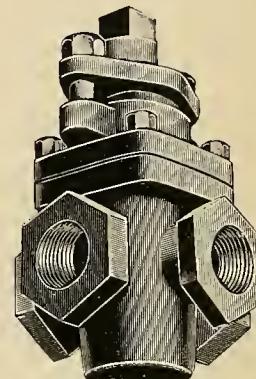


FIG. 227.  
FOUR-WAY.  
(WITH PACKED GLAND.)  
SCREWED OR FLANGED.

IRON AND BRASS. ASBESTOS PACKED COCKS. SCREWED AND FLANGED

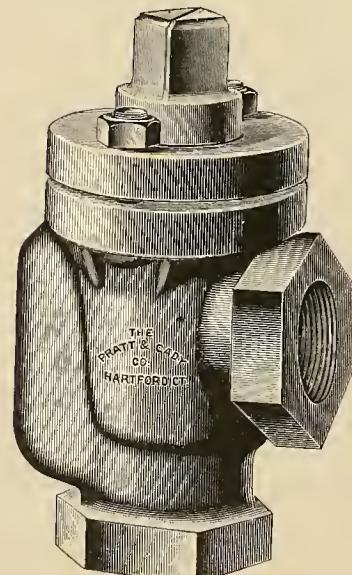


FIG. 228.  
ANGLE.

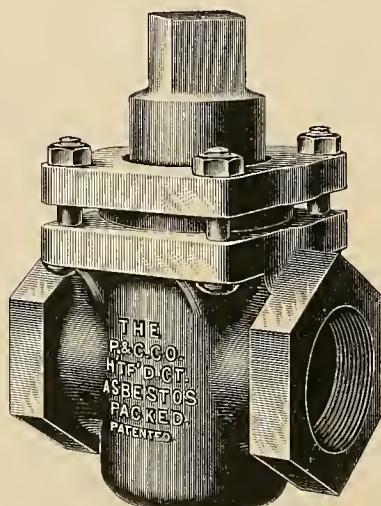


FIG. 229.  
TWO-WAY.

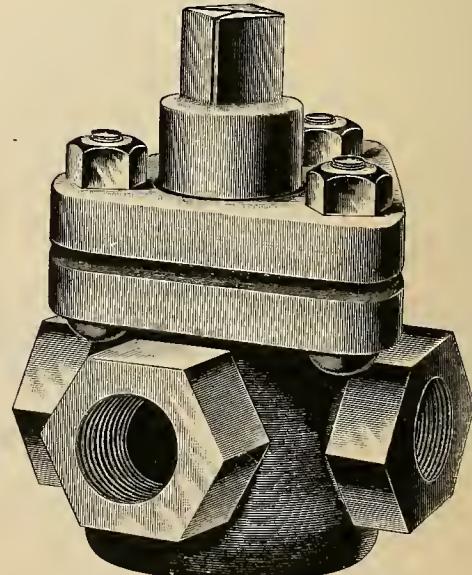


FIG. 230.  
THREE-WAY.

Descriptive Circular on Application.

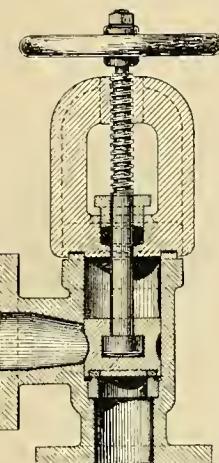


FIG. 231.  
SECTION.

MYER'S PATENT BLOW-OFF VALVE.

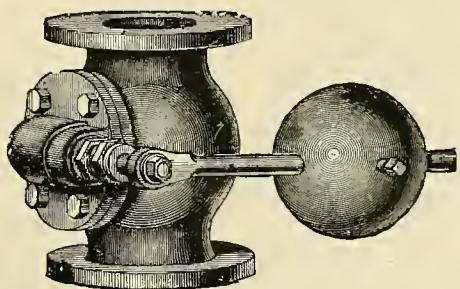


FIG. 233.  
BACK PRESSURE VALVE,  
SCREWED AND FLANGED,  
FOR HORIZONTAL OR VERTICAL LINES.

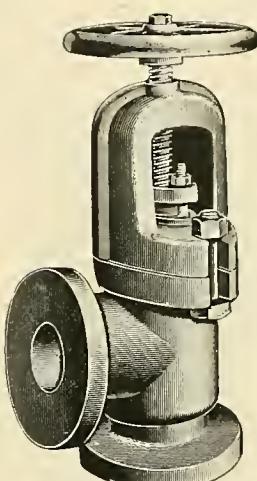


FIG. 232.  
FLANGED.

EXPANSION JOINTS.

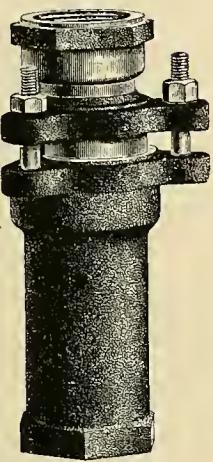


FIG. 234.  
IRON BODY  
SCREWED

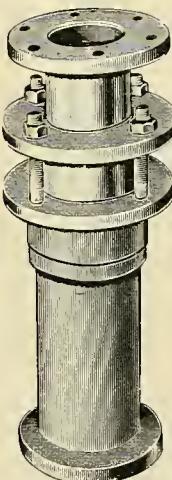


FIG. 235.  
IRON BODY.  
FLANGED.

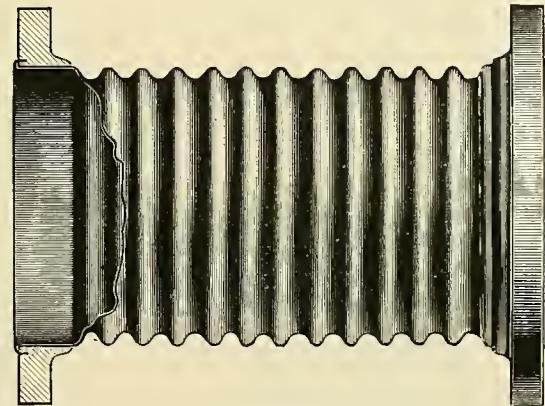


FIG. 236.  
CORRUGATED COPPER.  
SCREWED OR FLANGED.

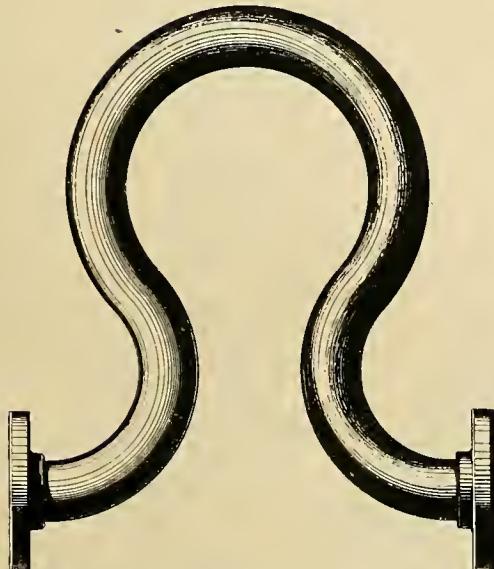


FIG. 237.  
COPPER.

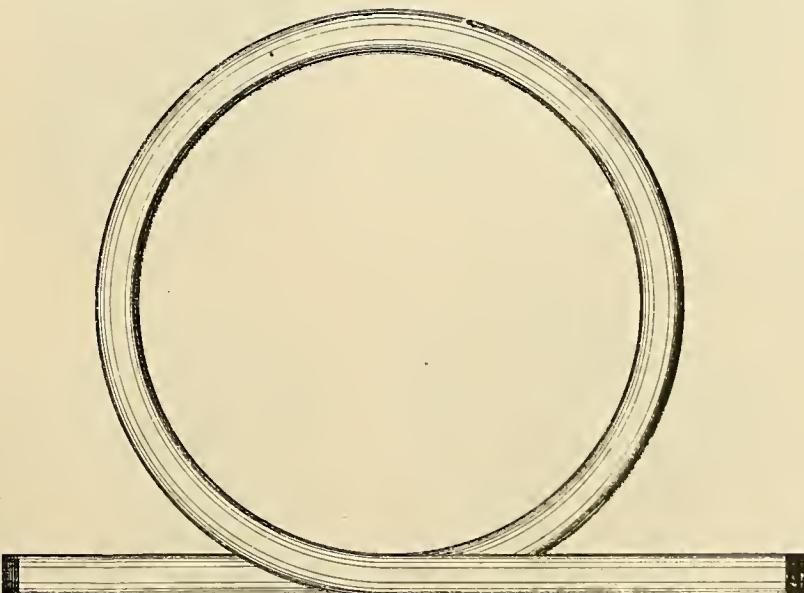
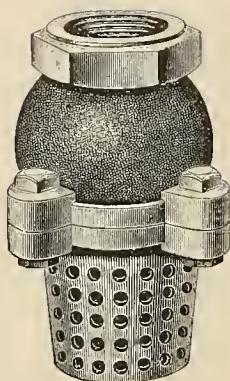
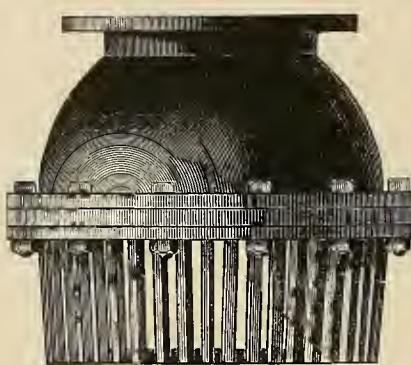


FIG. 238.  
IRON PIPE OR LOOP EXPANSION.

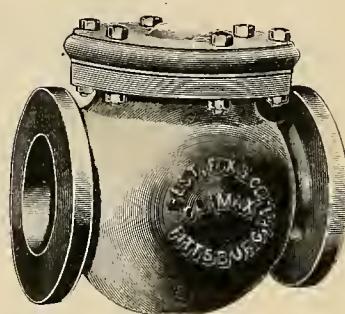
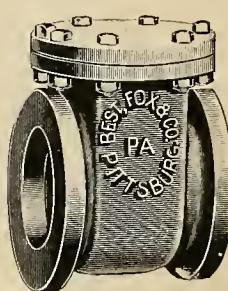
For Sizes and Dimensions, see Table page 104.

## FOOT VALVES AND STRAINERS.

## FOOT VALVES.

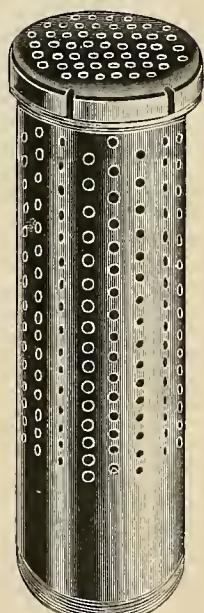
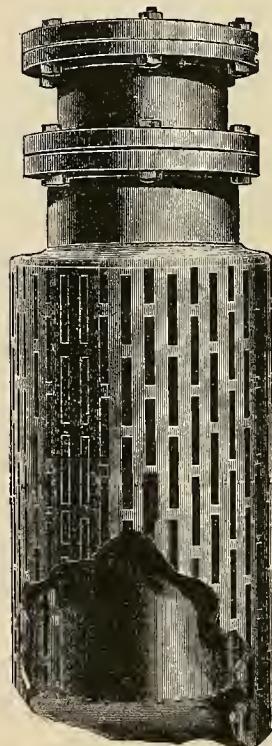
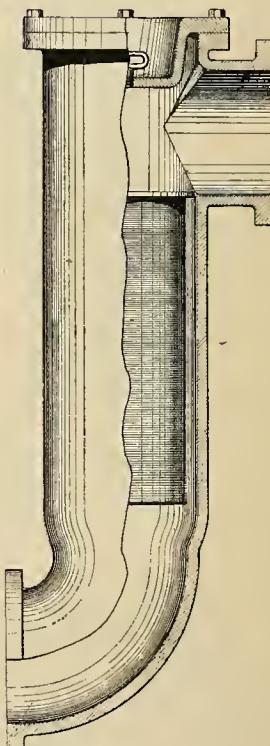
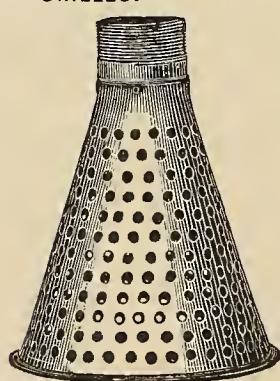
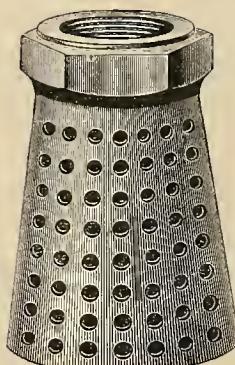
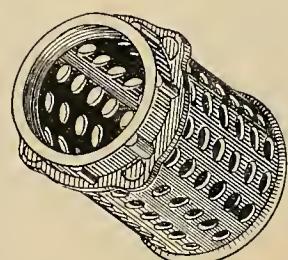
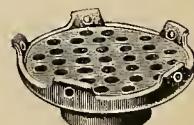
FIG. 239.  
SCREWED.FIG. 240.  
FLANGED.

## STRAINERS.

FIG. 241.  
GLOBE BODY.  
SCREWED OR FLANGED.FIG. 242.  
GATE BODY.  
SCREWED OR FLANGED.

For Sizes and Dimensions see Table page 104.

## STRAINERS.

FIG. 243.  
WROT. IRON PIPE.  
DRILLED.FIG. 244.  
CAST IRON.  
SLOTTED.FIG. 245.  
PUMP STRAINER.  
WITH BASKET.FIG. 246.  
WROUGHT IRON.  
GALVANIZED.FIG. 247.  
CAST IRON.FIG. 248.  
MALLEABLE IRON.  
FOR SYPHON PUMPS.FIG. 249.  
FOR SYPHON PUMPS.

## BRASS VALVES.

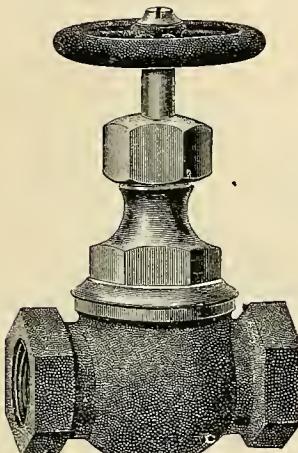


FIG. 250.

GLOBE VALVE.

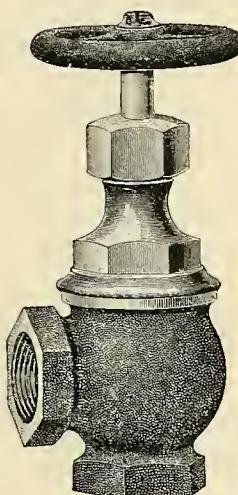


FIG. 251.

ANGLE VALVE.

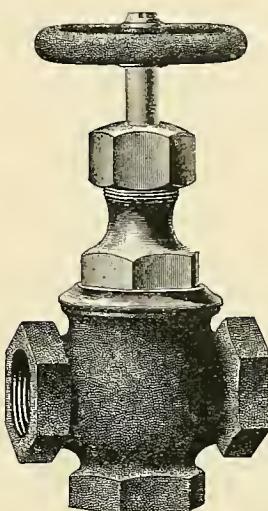


FIG. 252.

CROSS VALVE.

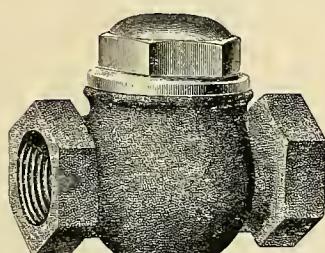


FIG. 253.

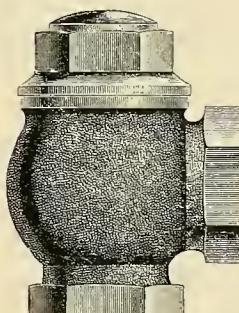
CHECK VALVE.  
HORIZONTAL.

FIG. 254.

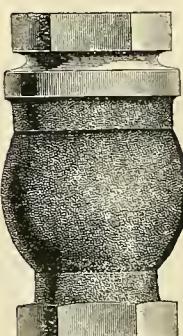
CHECK VALVE.  
ANGLE.

FIG. 255.

CHECK VALVE.  
VERTICAL.

FIG. 256.

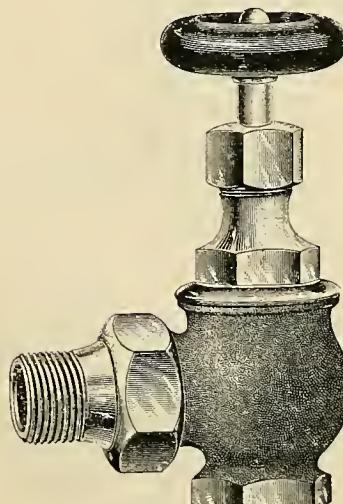
RADIATOR VALVE.  
FEMALE.

FIG. 257.

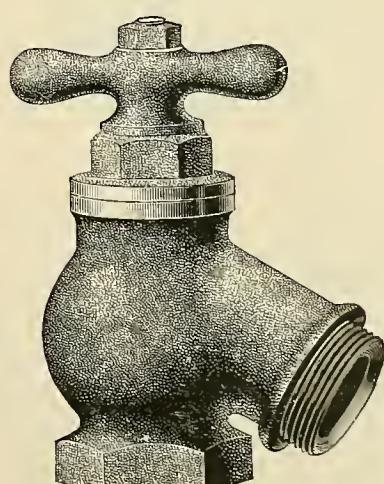
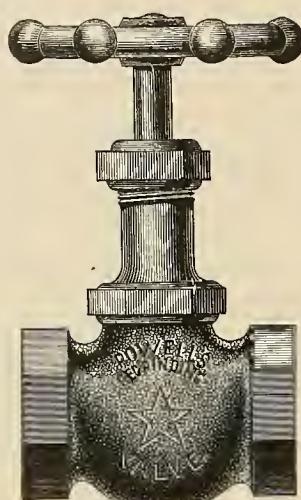
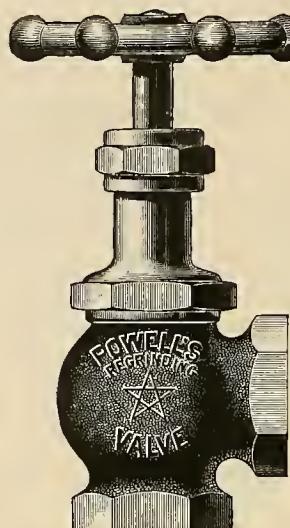
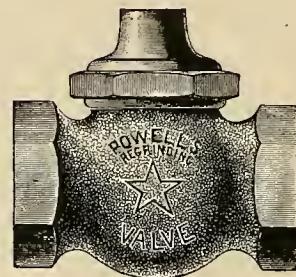
RADIATOR VALVE.  
WITH UNION.

FIG. 258.

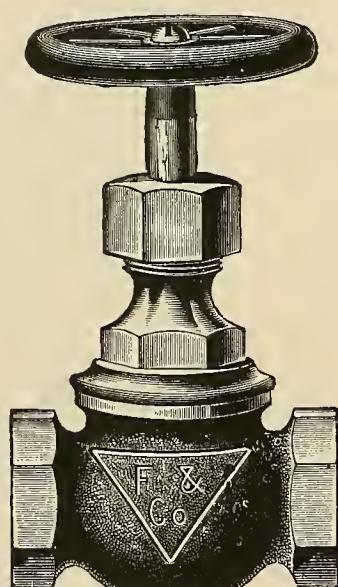
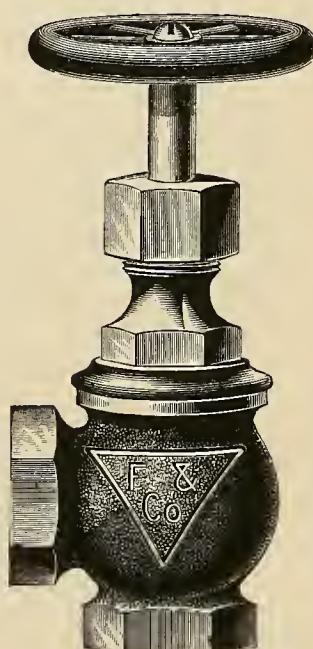
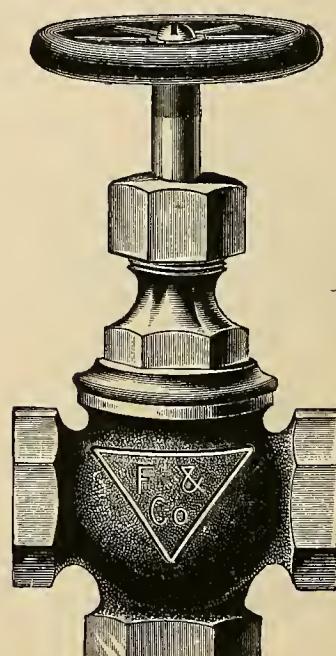
COKE-OVEN VALVE.

For Dimensions see Table page 103.

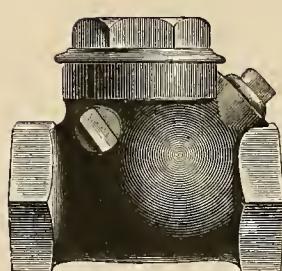
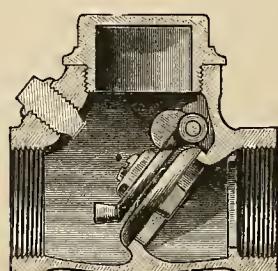
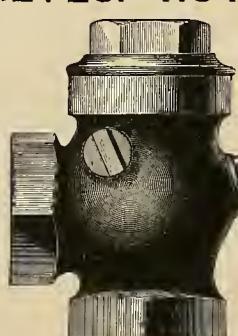
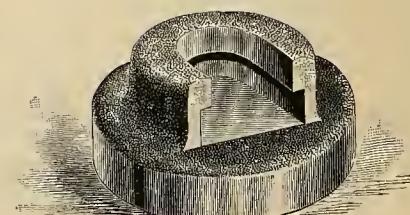
## POWELL'S STAR RE-GRINDING VALVES.—BRASS.

FIG. 259.  
GLOBE VALVE.FIG. 260.  
ANGLE VALVE.FIG. 261.  
CHECK VALVE.

## ASBESTOS DISC BRASS VALVES.

FIG. 262.  
GLOBE VALVE.FIG. 263.  
ANGLE VALVE.FIG. 264.  
CROSS VALVE.

## SWINGING CHECK VALVES.—ROTATING DISC.

FIG. 265.  
HORIZONTAL OR  
VERTICAL.FIG. 266.  
HORIZONTAL.  
SECTIONFIG. 267.  
ANGLE.FIG. 268.  
ASBESTOS DISC AND  
HOLDER COMPLETE.  
FOR ALL SIZES

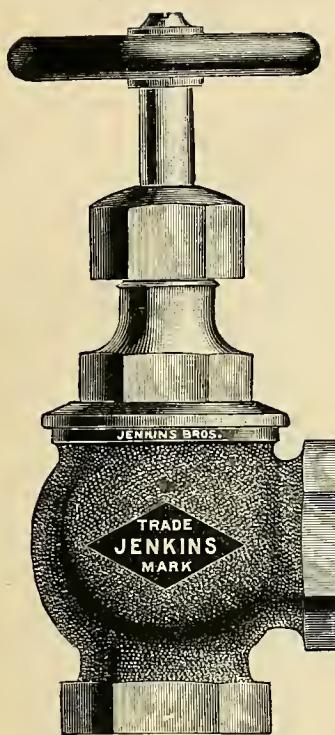
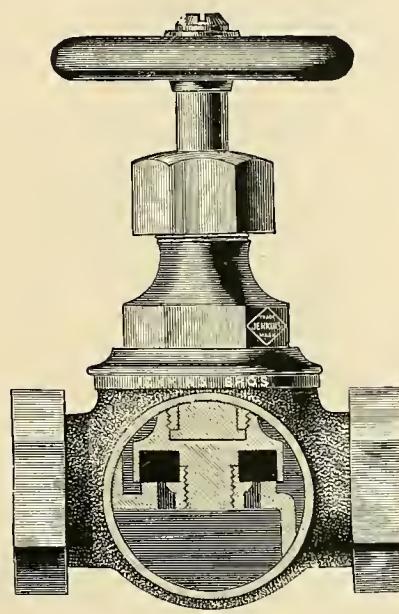
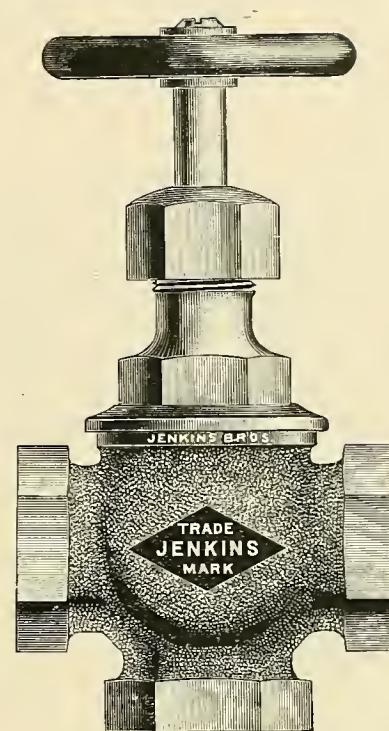
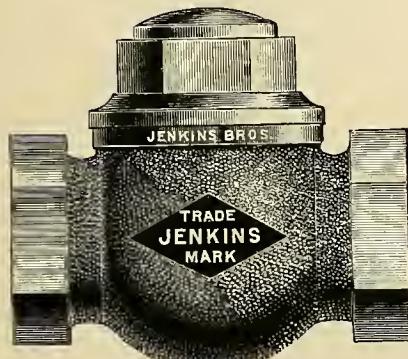
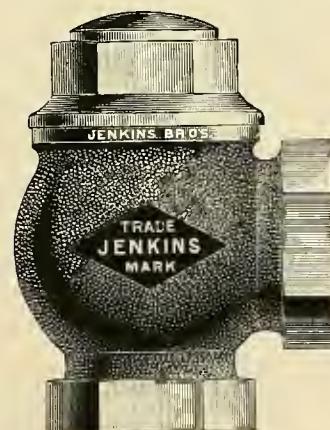
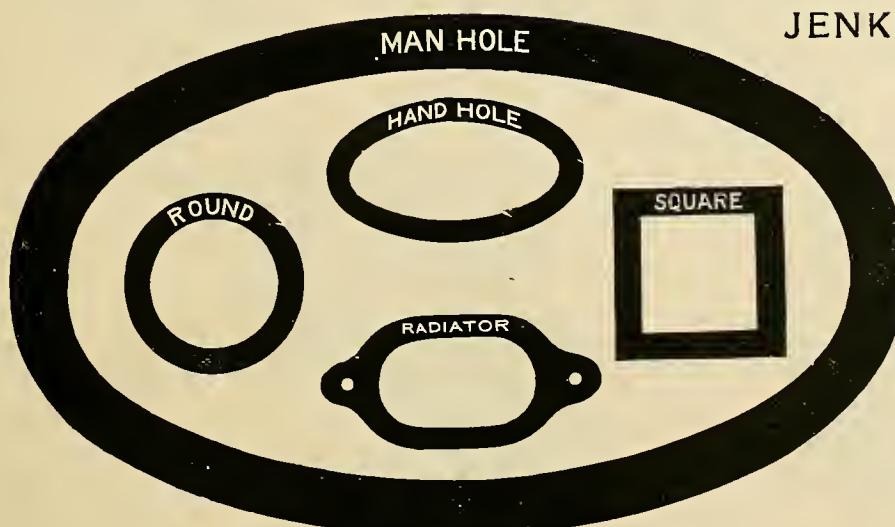
FIG. 269.  
ANGLE VALVE.FIG. 270.  
GLOBE VALVE.FIG. 271.  
CROSS VALVE.FIG. 272.  
CHECK VALVE.  
HORIZONTAL.FIG. 273.  
CHECK VALVE.  
ANGLE.FIG. 274.  
CHECK VALVE  
VERTICAL.

FIG. 275.

## JENKINS' STANDARD.

## DISCS

FROM  $\frac{1}{4}$  TO 24 INCH DIAM.GASKETS.  
ALL SIZES.

FIG. 276.

## BRASS VALVES.

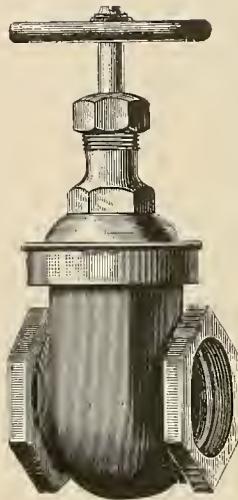


FIG. 277.  
GATE VALVE.

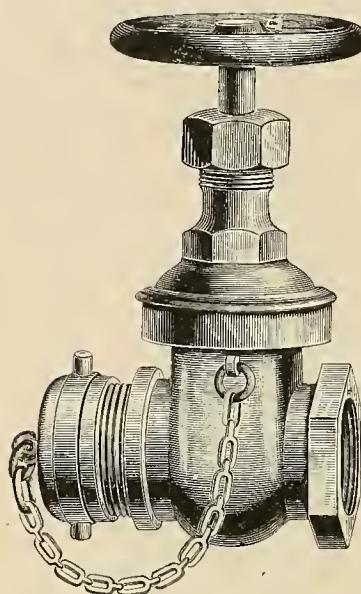


FIG. 278.  
GATE VALVE  
WITH HOSE CAP.

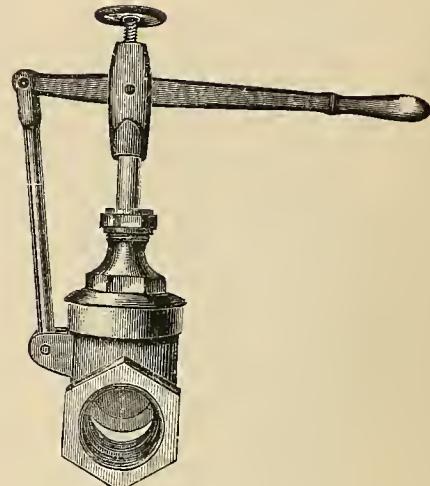


FIG. 279.  
GATE VALVE.  
QUICK OPENING.

For Dimensions, see Table page 103.

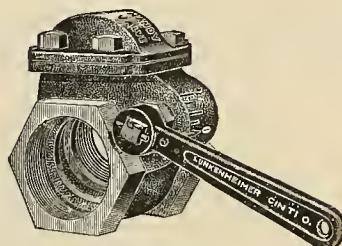
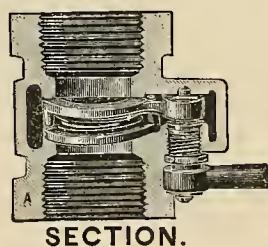


FIG. 280.  
HANDY GATE VALVE.  
LUNKENHEIMERS.



SECTION.

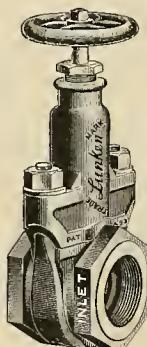


FIG. 281.  
LUNKEN GATE VALVE.  
BRASS AND IRON.

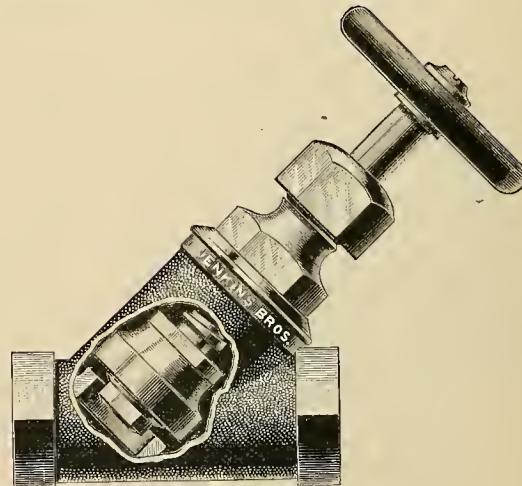


FIG. 282.  
Y VALVE.

## BRASS SAFETY VALVES.

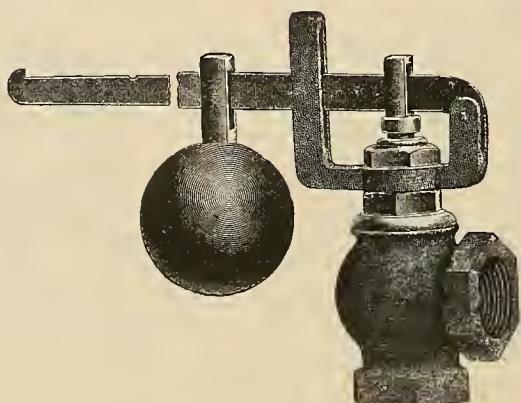


FIG. 283.  
ANGLE.

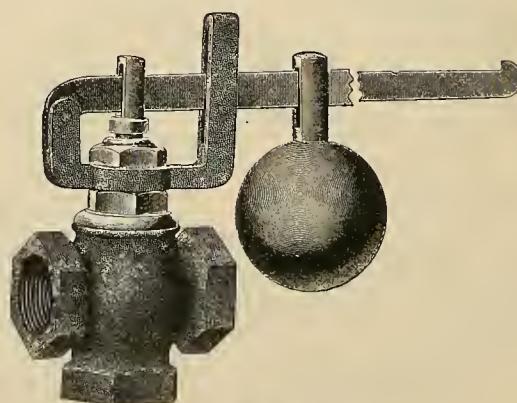


FIG. 284  
THREE-WAY.

## BRASS COCKS.

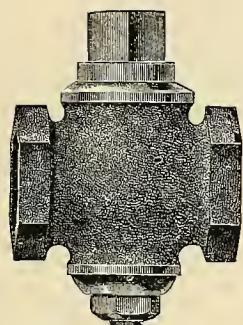


FIG. 285.  
SQUARE HEAD.

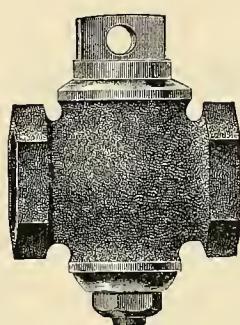


FIG. 286.  
FLAT HEAD.

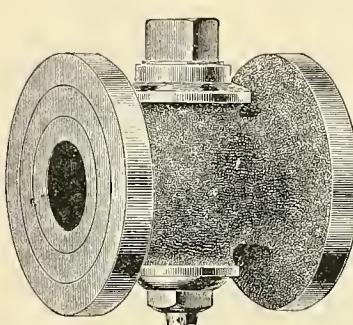


FIG. 287.  
SQ. AND FLAT HEAD.  
FLANGED.

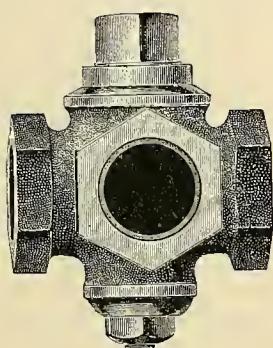


FIG. 288.  
THREE WAY.

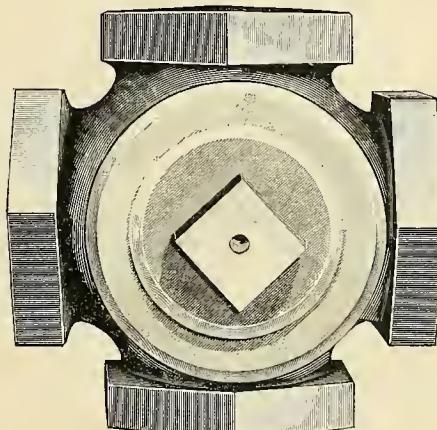


FIG. 289.  
FOUR WAY.

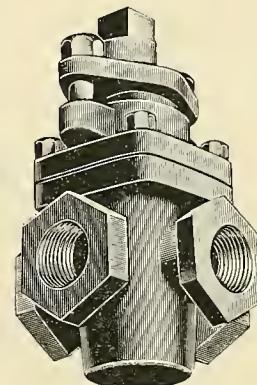


FIG. 290.  
FOUR WAY.  
WITH PACKED GLAND.  
SCREWED AND FLANGED.

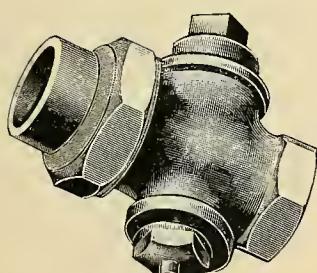


FIG. 291.  
COCK, WITH COUPLING.

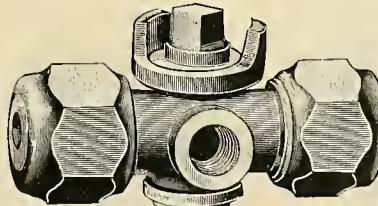


FIG. 292.  
HYDRAULIC COCK.  
WITH COUPLING NUTS

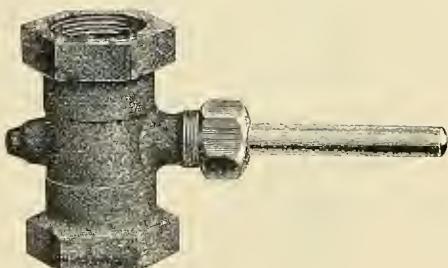


FIG. 293.  
BUTTERFLY VALVE.



FIG. 294.  
COCK WRENCHES.  
ALL SIZES.

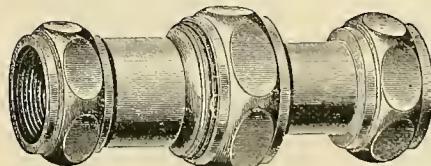


FIG. 295.  
BRASS EXPANSION JOINT.

Special Cocks to Order.

## TUYERE COCKS AND UNIONS.—GROUND JOINTS.

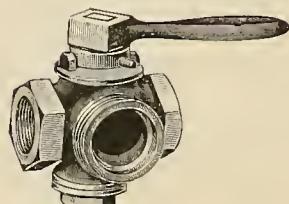


FIG. 296.  
TUYERE COCK (New Style.)  
WITHOUT COUPLING.

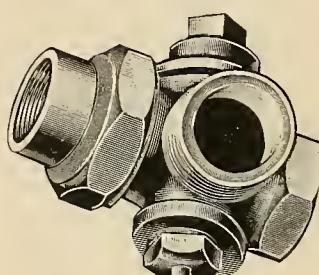


FIG. 297.  
TUYERE COCK (old Style.)  
WITH COUPLING FOR IRON OR LEAD PIPE.

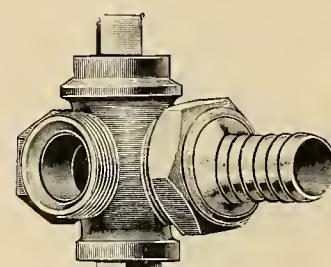


FIG. 298.  
TUYERE COCK (old Style.)  
WITH COUPLING FOR HOSE.

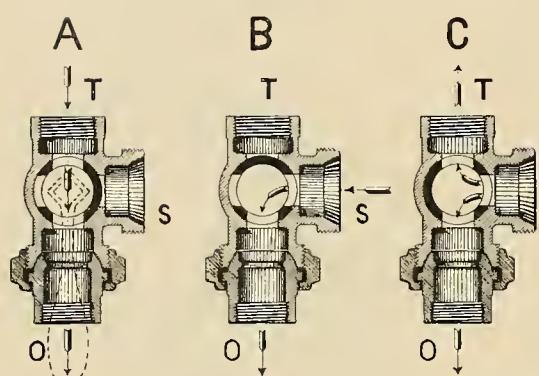


FIG. 299.  
OLD STYLE TUYERE COCK.  
SECTION.

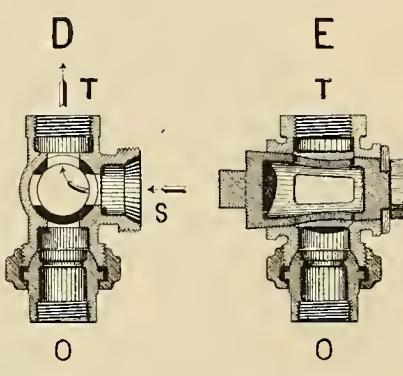


FIG. 300.  
NEW STYLE TUYERE COCK.  
SECTION.

## BRASS UNIONS.—GROUND JOINTS.

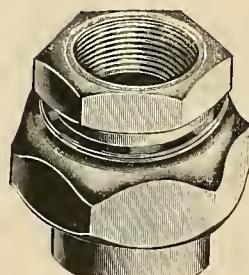


FIG. 301.  
HEAVY.  
FOR IRON PIPE

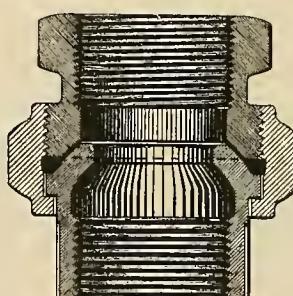


FIG. 302.  
HEAVY.  
SECTION.

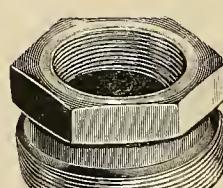


FIG. 303.  
MALE HALF  
OF UNION

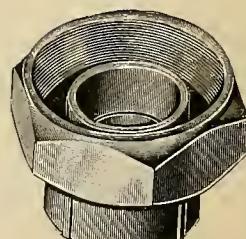


FIG. 304.  
FEMALE HALF  
OR NUT AND SWIVEL.

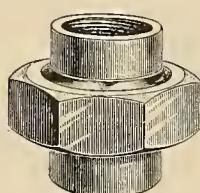


FIG. 305.  
STANDARD.

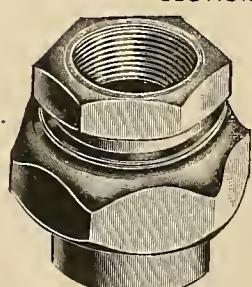


FIG. 306.  
HEAVY  
FOR IRON AND LEAD PIPE.

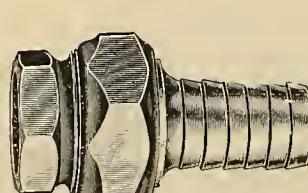


FIG. 307.  
HEAVY  
FOR IRON PIPE AND HOSE.

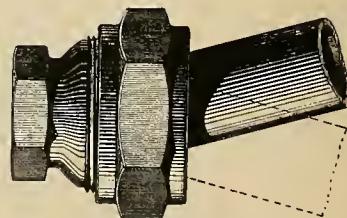
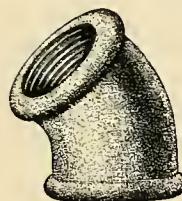
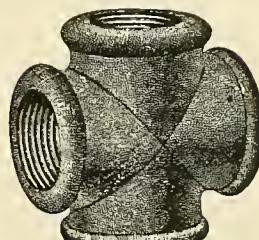
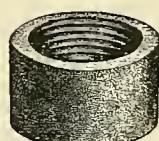
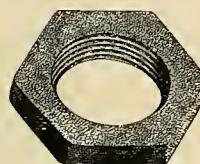
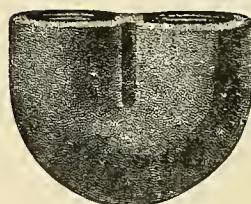
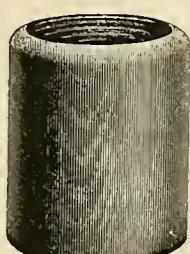


FIG. 308.  
UNIVERSAL.

## STANDARD BRASS FITTINGS.

ROUGH OR FINISHED.

FIG. 309.  
90° ELBOW.FIG. 310.  
45° ELBOW.FIG. 311.  
TEE.FIG. 312.  
CROSS.FIG. 313.  
REDUCER.FIG. 314.  
PLUG,  
SQUARE HEAD.FIG. 315.  
PLUG,  
COUNTERSUNK HEAD.FIG. 316.  
CAP.FIG. 317.  
LOCKNUT.FIG. 318.  
BUSHING.FIG. 319.  
RETURN BEND.  
OPEN.FIG. 320.  
RETURN BEND.  
CLOSE.FIG. 321.  
CLOSE NIPPLE.FIG. 322.  
SHOULDER NIPPLE.FIG. 323.  
SOCKET OR COUPLING.FIG. 324.  
SOCKET.  
RIGHT AND LEFT.

Reducing and Special Fittings to order.

Copper Plugs to order.

## AIR AND CYLINDER COCKS.



FIG. 325.  
TEE HANDLE.

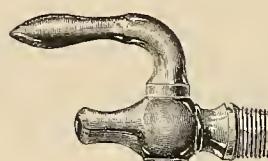


FIG. 326.  
LEVER HANDLE.

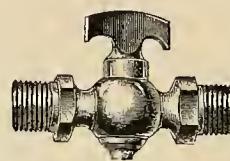


FIG. 327.  
DOUBLE THREAD,  
MALE.

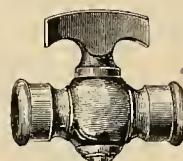


FIG. 328.  
DOUBLE THREAD,  
FEMALE.

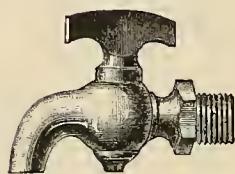


FIG. 329.  
BIBB NOZZLE.  
TEE HANDLE.

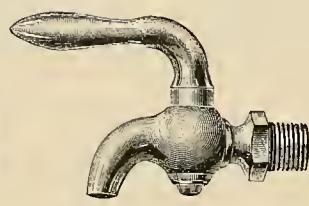


FIG. 330.  
BIBB NOZZLE.  
LEVER HANDLE.

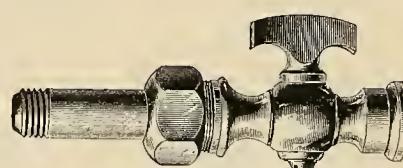


FIG. 331.  
CYLINDER COCK.  
WITH UNION, TEE HANDLE.

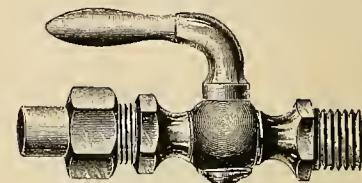


FIG. 332  
CYLINDER COCK.  
WITH UNION, LEVER HANDLE.

## GAUGE COCKS.



FIG. 333.  
MISSISSIPPI.



FIG. 334  
COMPRESSION.

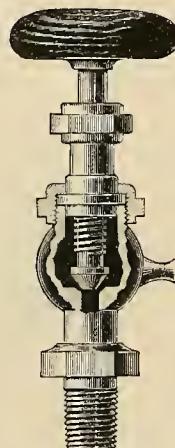


FIG. 335.  
COMPRESSION.  
REGRINDING.



FIG. 336.  
REGISTER.

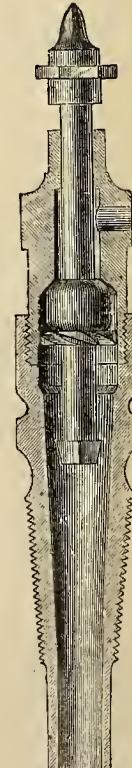


FIG. 337.  
BINGHAM  
REGRINDING.

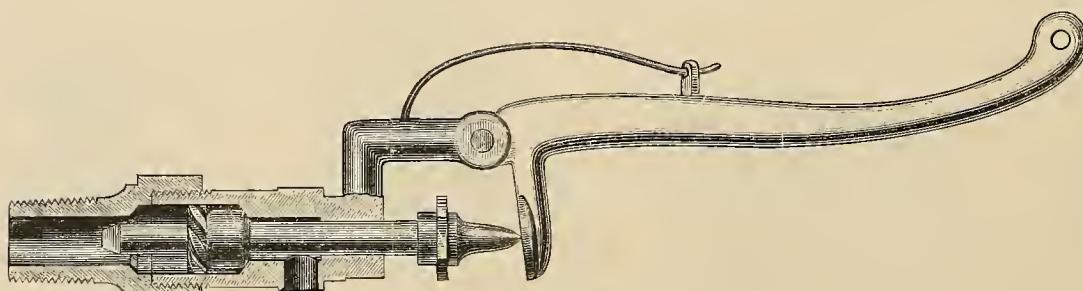


FIG. 338.  
BINGHAM REGRINDING WITH LEVER.

Threads Chased to Order.

## WATER GAUGES.

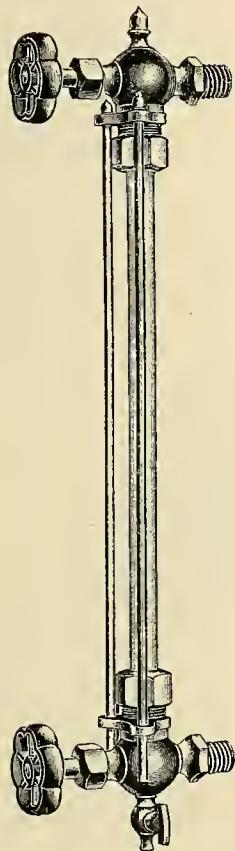


FIG. 339.  
NO. 4.  
 $1\frac{1}{2} \times \frac{3}{8}$  GLASS TUBE.

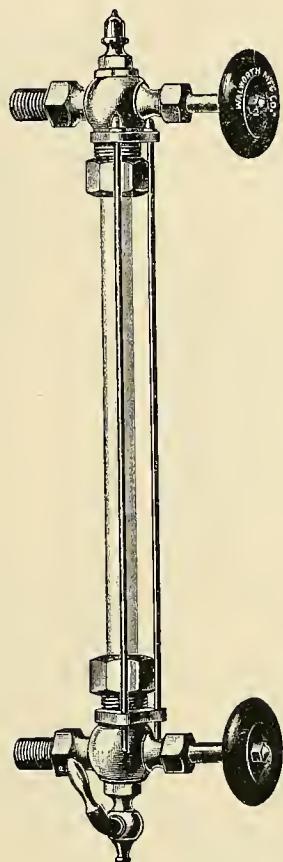


FIG. 340  
NO. 6.  
 $1\frac{1}{2} \times \frac{3}{8}$  GLASS TUBE.

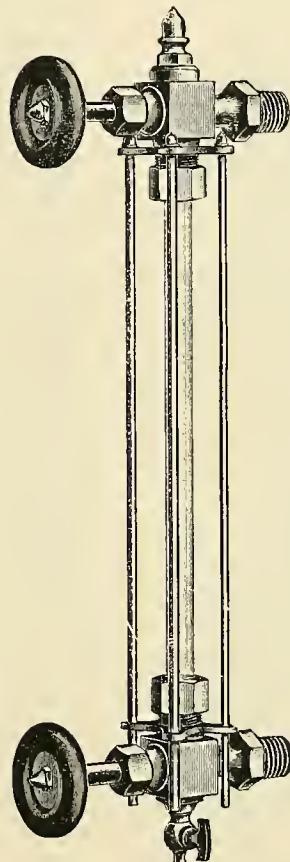


FIG. 341.  
NO. 7.  
 $1\frac{1}{2} \times \frac{3}{8}$  GLASS TUBES

Water Gauges with longer and larger tubes furnished from stock.

## WHISTLES.

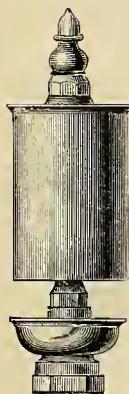


FIG. 342.  
PLAIN.

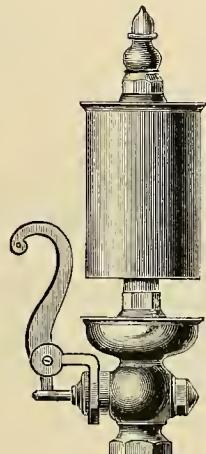


FIG. 343.  
WITH VALVE.



FIG. 344.  
WHISTLE VALVE.

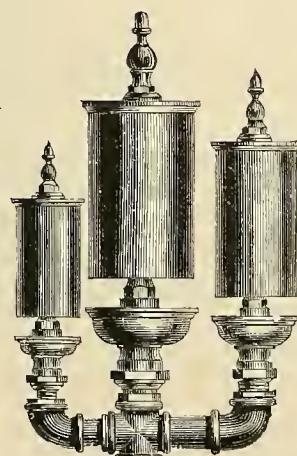


FIG. 345.  
CHIME.

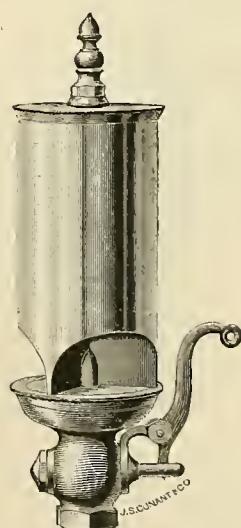
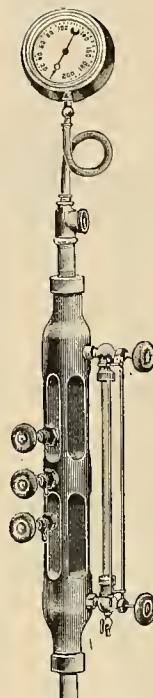
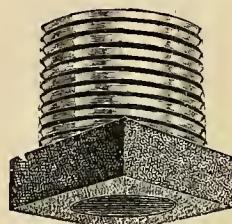
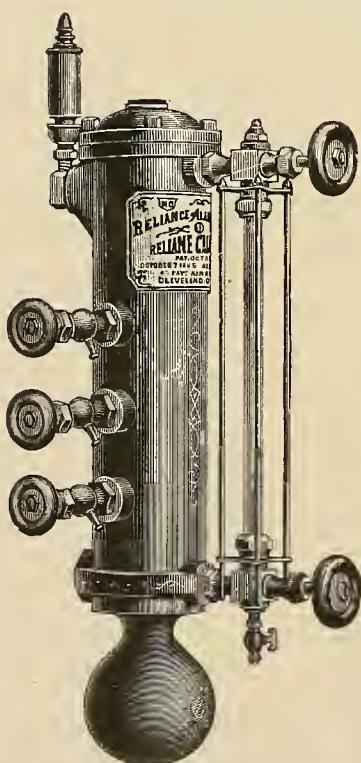
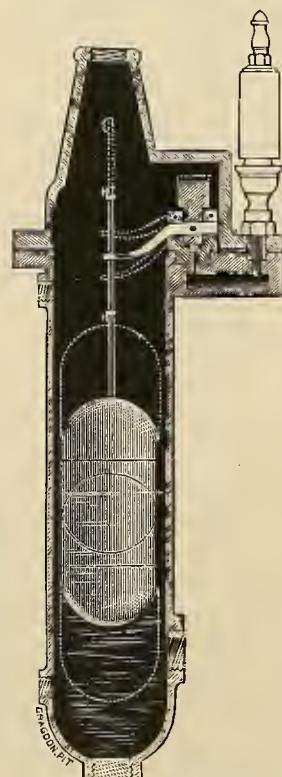
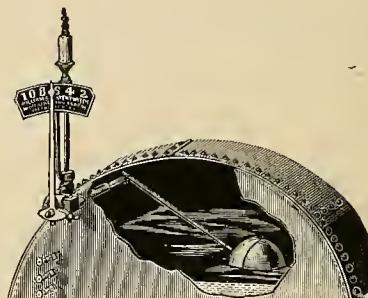
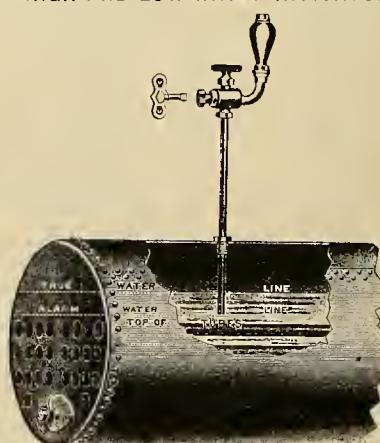


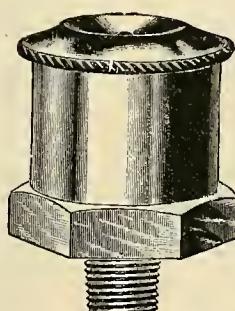
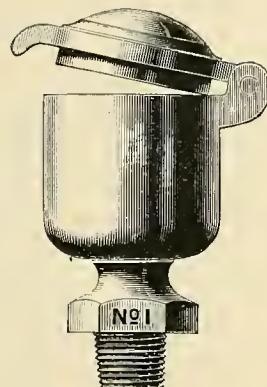
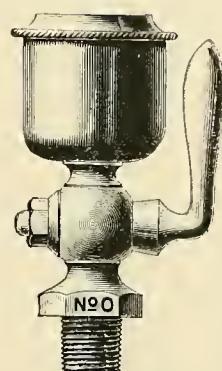
FIG. 346.  
CHIME,  
IN ONE WHISTLE.

## WATER GAUGE COLUMNS.

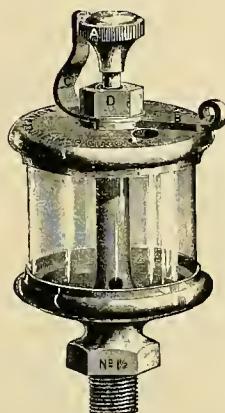
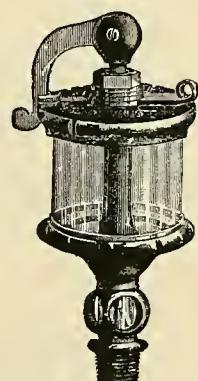
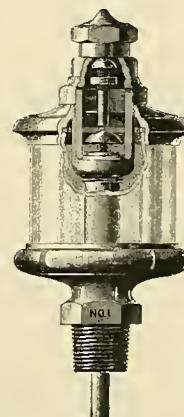
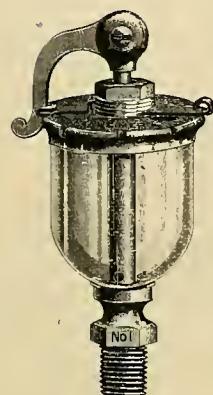
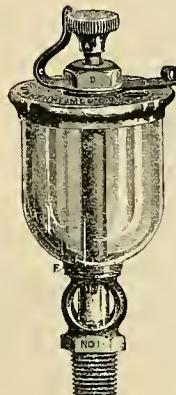
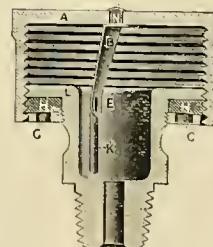
FIG. 347.  
NO. 1.FIG. 348.  
NO. 2.FIG. 349.  
NO. 6.  
COMPLETEFIG. 350.  
GLASS TUBES.FIG. 351.  
GUM WASHERS.  
FOR GLASS TUBES.FIG. 352.  
FUSIBLE PLUG.FIG. 353.  
RELIANCE SAFETY.  
HIGH AND LOW WATER COLUMNFIG. 354.  
WILLIAMS' SAFETY.  
HIGH AND LOW WATER COLUMNFIG. 355.  
WILLIAMS' SAFETY.  
HIGH AND LOW WATER INDICATOR.FIG. 356.  
CRANE'S  
LOW WATER ALARM.

Descriptive Circular on Application.

## BRASS OIL CUPS.

FIG. 357.  
PLAIN.FIG. 358.  
LOCOMOTIVE.FIG. 359.  
HINGE LID.FIG. 360.  
LEVER HANDLE.

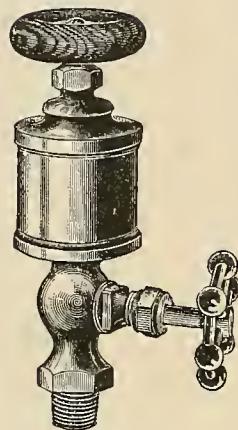
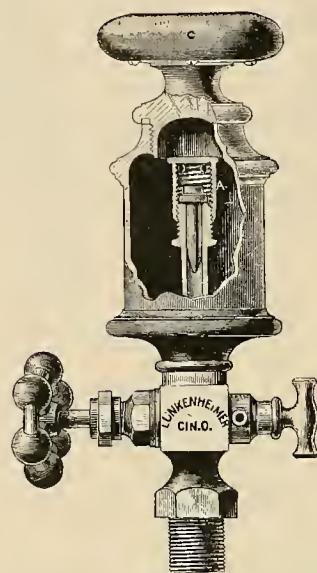
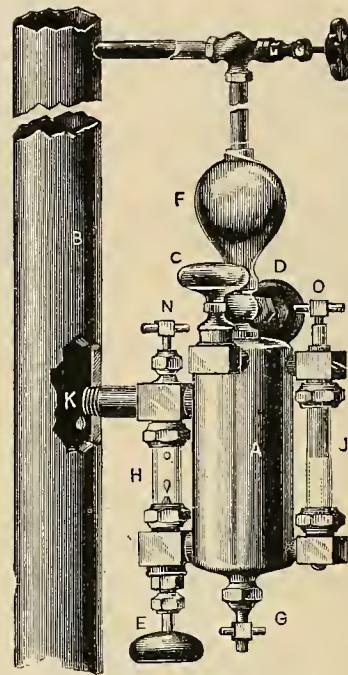
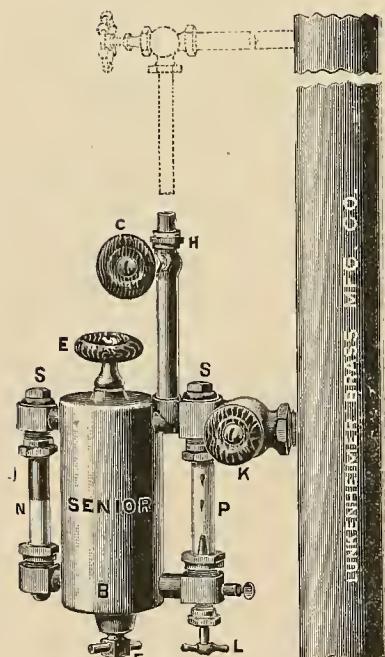
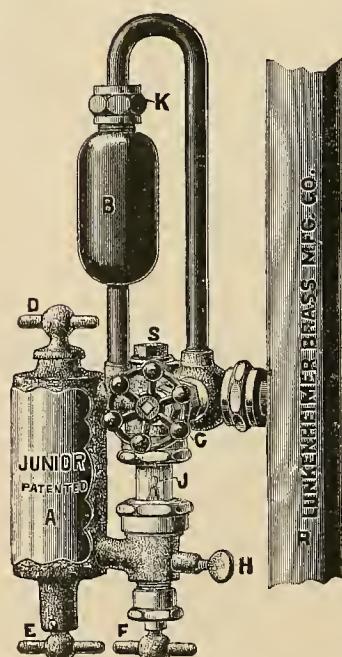
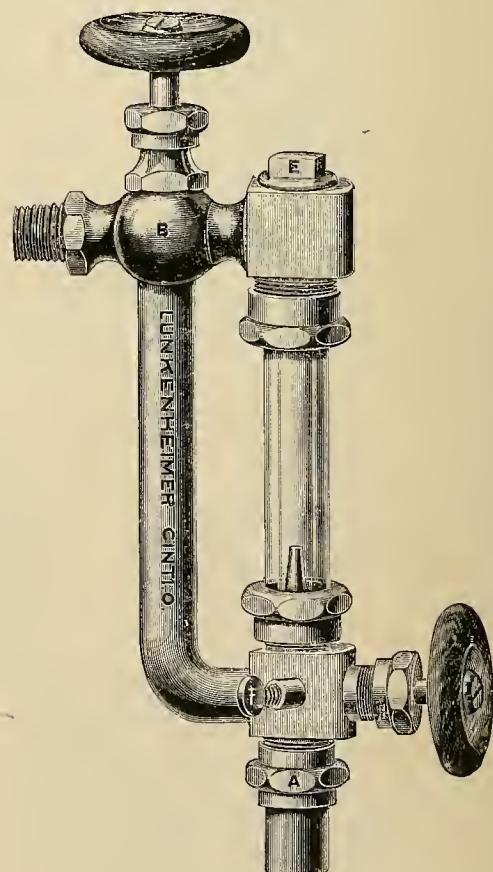
## GLASS OIL CUPS.

FIG. 361.  
PIONEER.  
SLIDE TOP.FIG. 362.  
ROYAL.  
SIGHT FEED.FIG. 363.  
CROWN.  
INDEX SIGHT FEED.FIG. 364.  
ROD CUP.  
FOR CRANK PINS.FIG. 365  
AJAX.  
INDEX.FIG. 366  
RIVAL.  
SIGHT FEED.FIG. 367.  
CODY'S  
SHAFT CUP.FIG. 368.  
GREASE CUP.

All Sizes of above Cups.

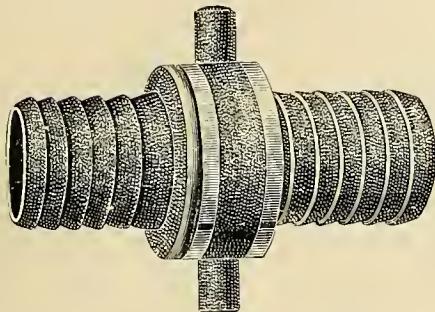
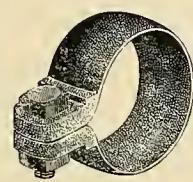
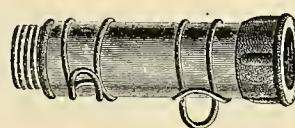
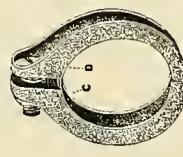
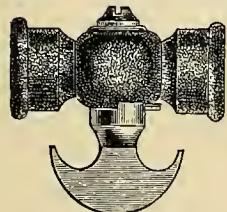
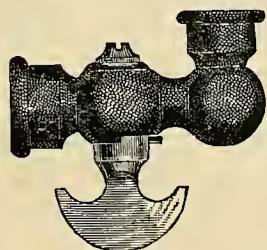
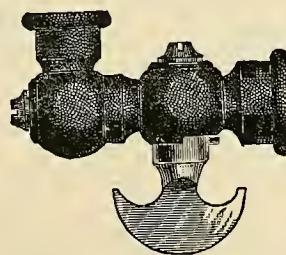
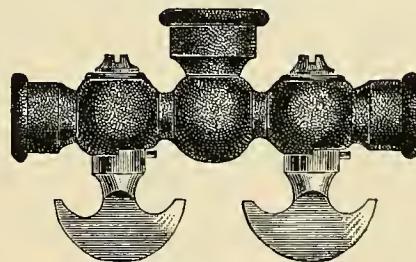
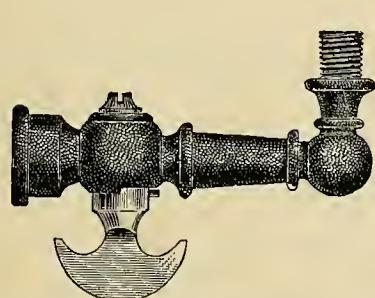
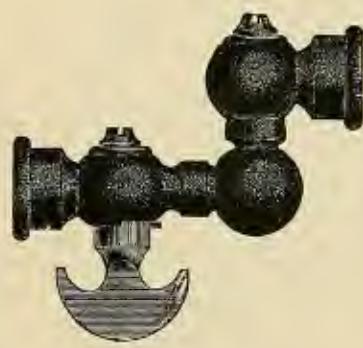
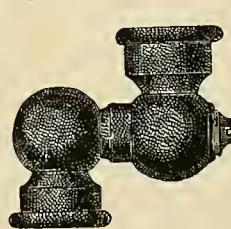
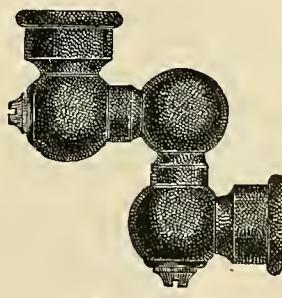
Descriptive Circular on Application

## LUBRICATORS.

FIG. 369.  
PLAIN.FIG. 370.  
AUTOMATIC OIL FEEDER.  
(NEEDLE VALVE.)FIG. 371.  
DETROIT SIGHT FEED.FIG. 372.  
SENIOR  
SIGHT FEEDFIG. 373.  
JUNIOR.  
SIGHT FEED.FIG. 374.  
INDEPENDENT.  
SIGHT FEED.

Descriptive Circulars of above on Application.

## HOSE CONNECTIONS.

FIG. 375.  
HOSE COUPLING.FIG. 376.  
NOZZLE.  
PLAIN.FIG. 377.  
NOZZLE.  
WITH COCK.FIG. 378.  
HEAVY IRON NOZZLE.  
BRASS NUT.FIG. 379.  
HOSE NIPPLE.FIG. 380.  
HOSE CLAMP.FIG. 381.  
CALDWELL HOSE  
CLAMP.FIG. 382.  
TUERK HOSE CLAMP.HEAVY GAS FIXTURE FITTINGS,  
FOR FACTORY AND MILL USE.FIG. 383.  
PENDANT COCK.  
STRAIGHT.FIG. 384.  
PENDANT COCK.  
ELBOW.FIG. 385.  
PENDANT COCK.  
SWING.FIG. 386.  
DOUBLE CENTER  
COCK.FIG. 387.  
ELBOW BURNER  
COCK.FIG. 388.  
SWING JOINT.  
WITH COCK.FIG. 389.  
SWING JOINT.FIG. 390.  
UNIVERSAL  
SWING JOINT.

Burners and Brackets for above in Stock.

## GAS FIXTURES AND BURNERS.



FIG. 391.  
**IRON BURNER.**  
BAT WING.



FIG. 392.  
**IRON BURNER.**  
FISH TAIL.



FIG. 393.  
**BRASS PILLAR.**  
FOR LAVA TIP.



FIG. 394.  
**MACKLEY BURNER.**  
FOR NATURAL GAS.



FIG. 395.  
**JUMBO BURNER.**  
FOR NATURAL GAS.

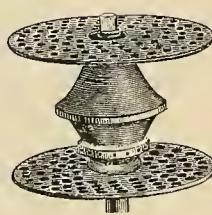


FIG. 396.  
**IRWIN STORM BURNER.**  
FOR NATURAL GAS.

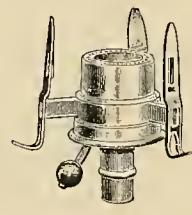


FIG. 397.  
**ARGAND BURNER.**  
AUTOMATIC.

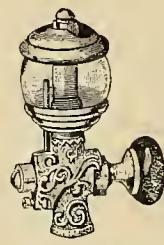


FIG. 398.  
**EUREKA BURNER.**  
SELF-LIGHTING.

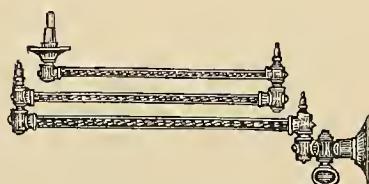


FIG. 399.  
**THREE SWING.**  
STRAIGHT BRACKET.

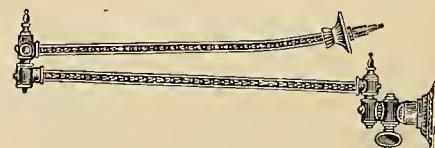


FIG. 400.  
**DOUBLE SWING.**  
STRAIGHT BRACKET UNIVERSAL.

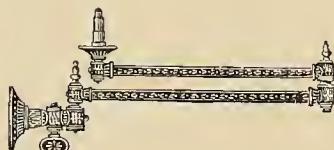


FIG. 401.  
**DOUBLE SWING.**  
STRAIGHT BRACKET.



FIG. 402.  
**SINGLE SWING.**  
STRAIGHT BRACKET.



FIG. 403.  
**STRAIGHT BRACKET.**  
STIFF.

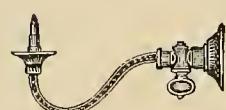


FIG. 404.  
**C BEND BRACKET.**  
STIFF.



FIG. 405.  
**C BEND SINGLE SWING.**  
BRACKET.

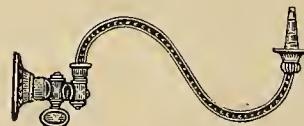


FIG. 406.  
**S BEND BRACKET.**

Iron and Lava Tips in Stock.

BRASS  
CAST STEEL  
" IRON

## HYDRAULIC FITTINGS AND COCKS

FROM 500 LBS. TO 3000  
LBS. PRESSURE

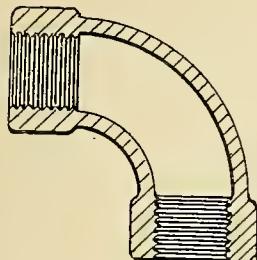


FIG. 407.  
ELBOW.

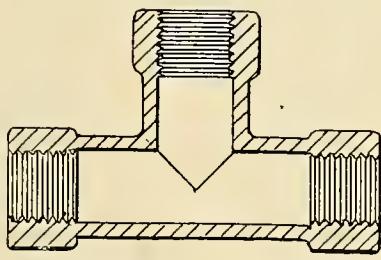


FIG. 408.  
TEE.

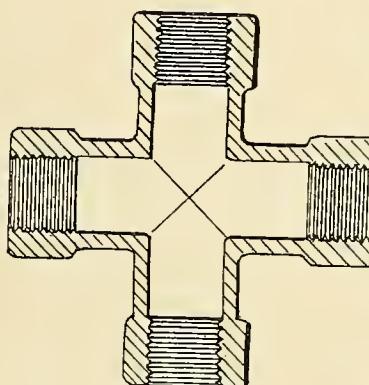


FIG. 409.  
CROSS.

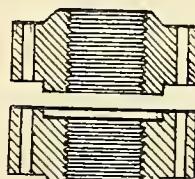


FIG. 410.  
FLANGED UNION.

JONES' PATENT HOSE  
COUPLING for Steam and  
Hydraulic Pressure.



FIG. 414.  
FEMALE HALF.

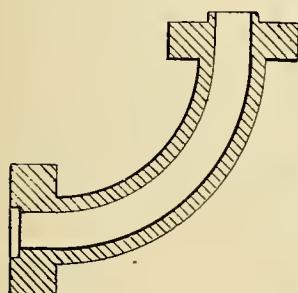


FIG. 411.  
FLANGED ELBOW.

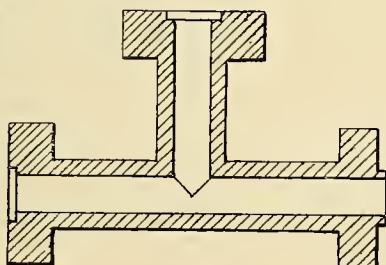


FIG. 412.  
FLANGED TEE.

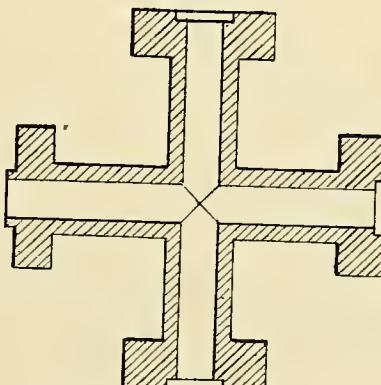


FIG. 413.  
FLANGED CROSS.



FIG. 415.  
MALE HALF.



FIG. 416.  
FOLLOWER.

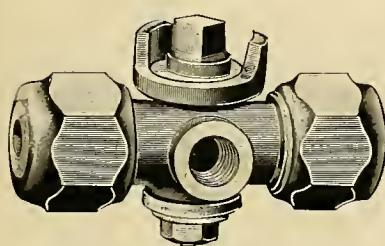


FIG. 417.  
HYDRAULIC.  
BRASS COCK.

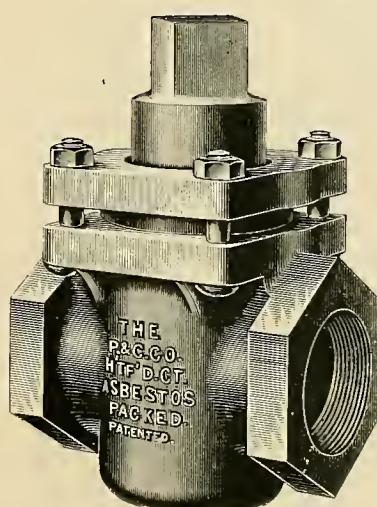


FIG. 418.  
HYDRAULIC ASBESTOS COCK.

SCREWED.

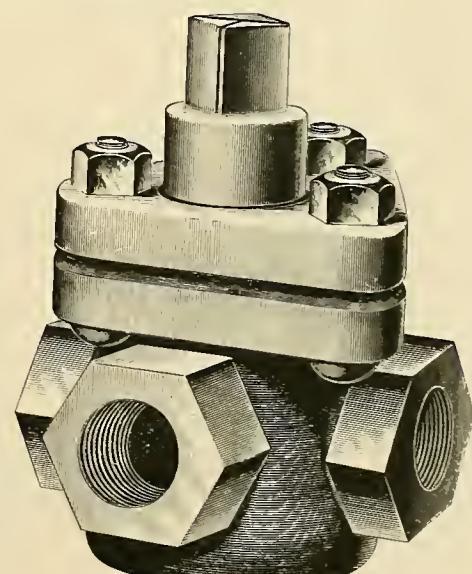


FIG. 419.  
HYDRAULIC ASBESTOS COCK.  
THREE-WAY.

Reducing Hydraulic Fittings to Order.

## CLIMAX PATENTED HYDRAULIC VALVE.

Balanced and Full Opening.

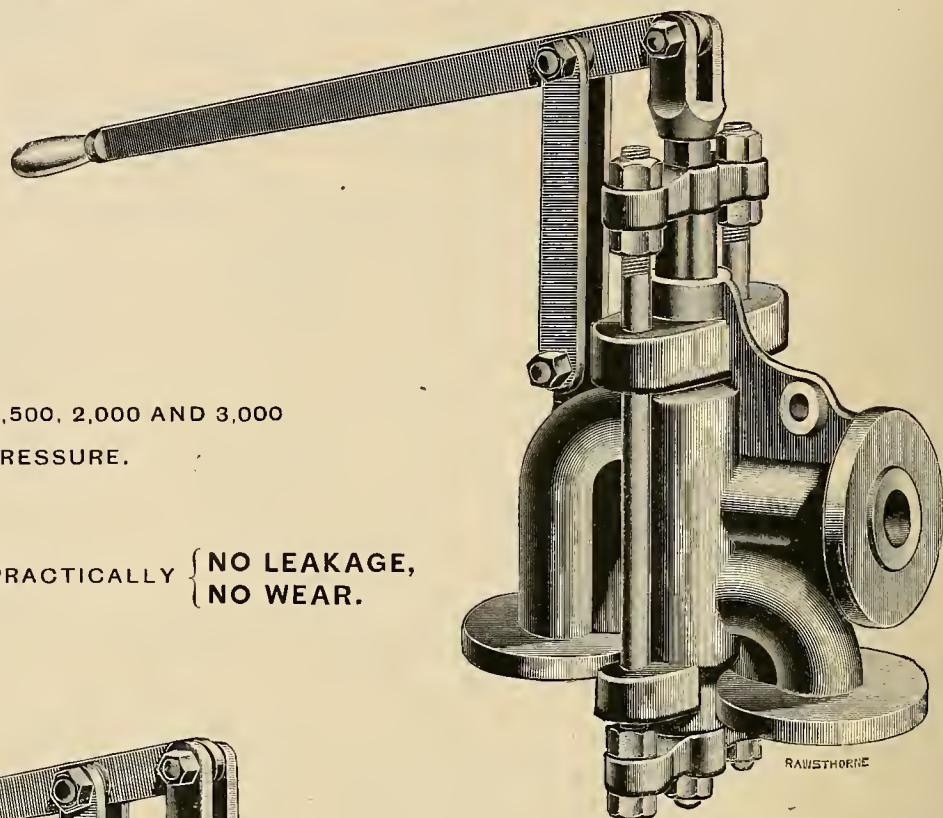
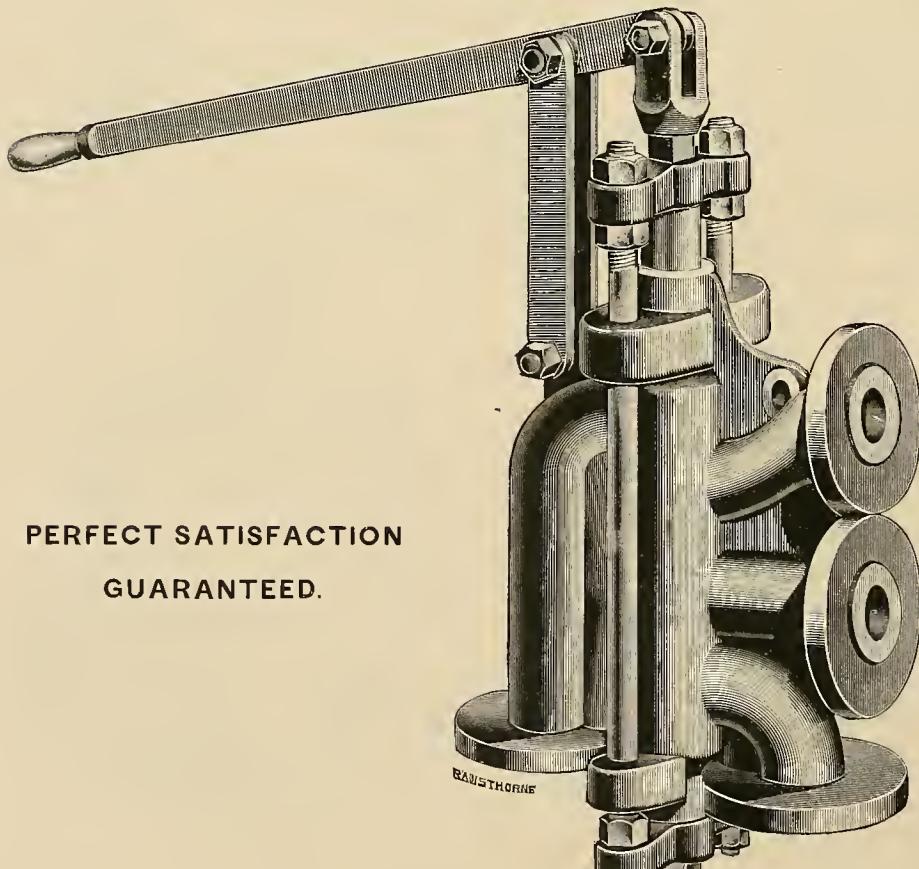


FIG. 420.

THREE WAY.



PERFECT SATISFACTION  
GUARANTEED.

DETAIL DRAWINGS  
FURNISHED ON APPLICATION.

FIG. 421.  
FOUR WAY.

BRASS.

HYDRAULIC VALVES.

IRON.

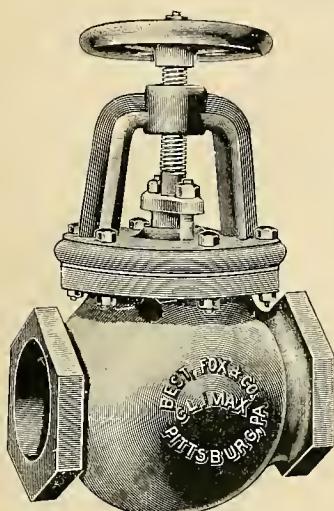


FIG. 422.  
GLOBE.

SCREWED AND FLANGED.

Fig. 4.

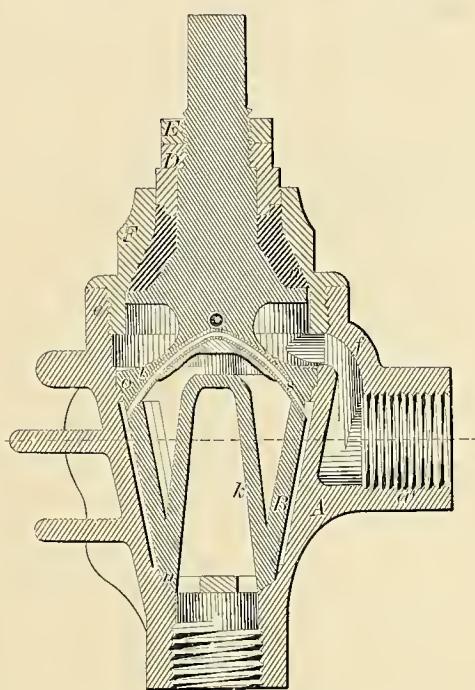


FIG. 423.  
GLENN'S HYDRAULIC  
BALANCE VALVE.  
PATENTED.

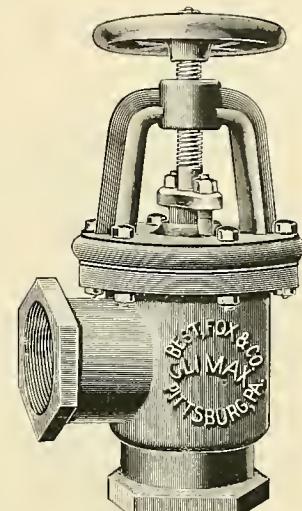


FIG. 424.  
ANGLE.

SCREWED AND FLANGED.

Fig. 5

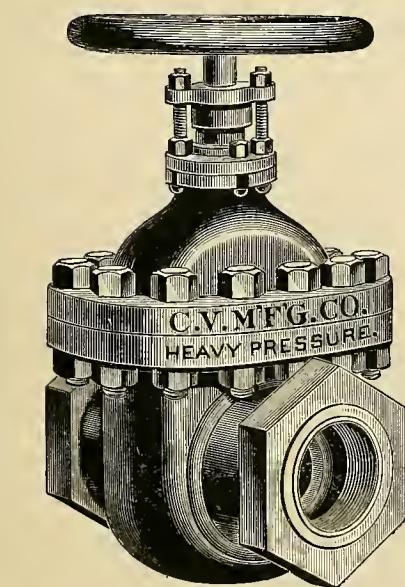
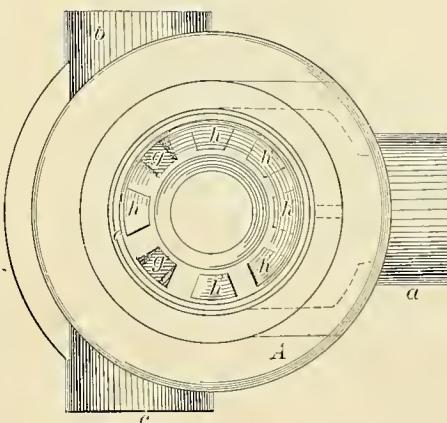


FIG. 425.  
GATE.  
SCREWED.

Fig. 2

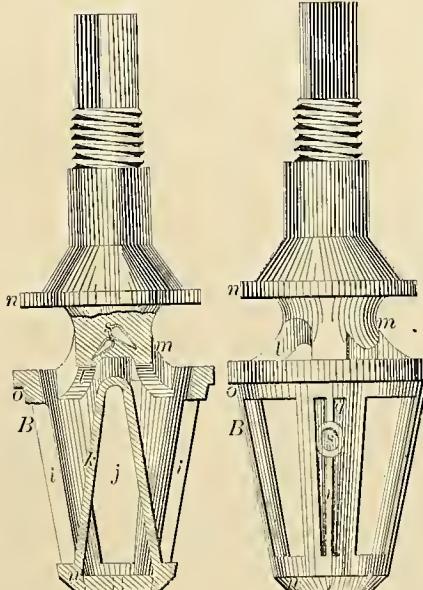


FIG. 426.  
GATE.  
FLANGED.

SPECIAL VALVES TO ORDER.

## HYDRAULIC VALVES.

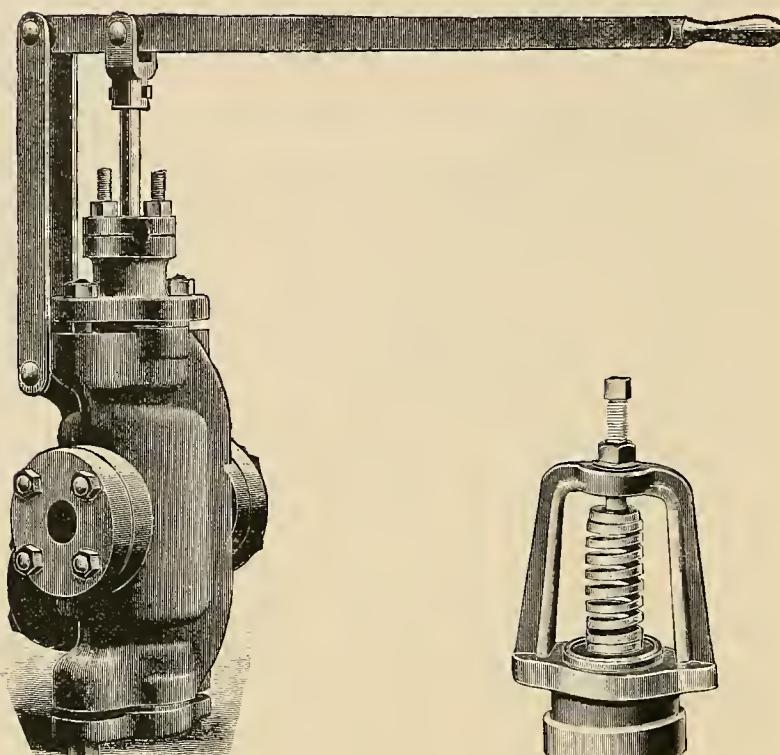


FIG. 427.  
CRITCHLOW'S  
HYDRAULIC VALVE.

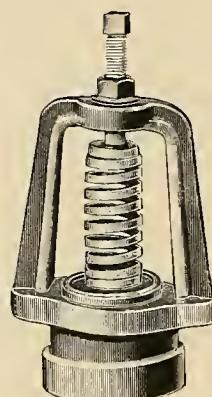


FIG. 429.  
RELIEF VALVE.

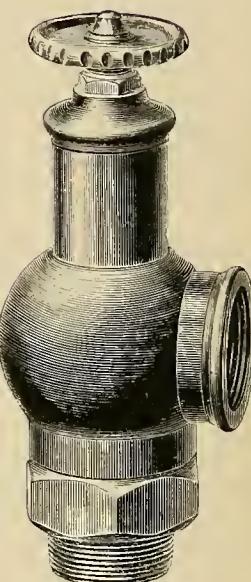


FIG. 428.  
CROSBY.  
WATER RELIEF VALVE.

## PULPIT.

WITH CRITCHLOW VALVES, ANGLE STOP AND WASTE VALVES.

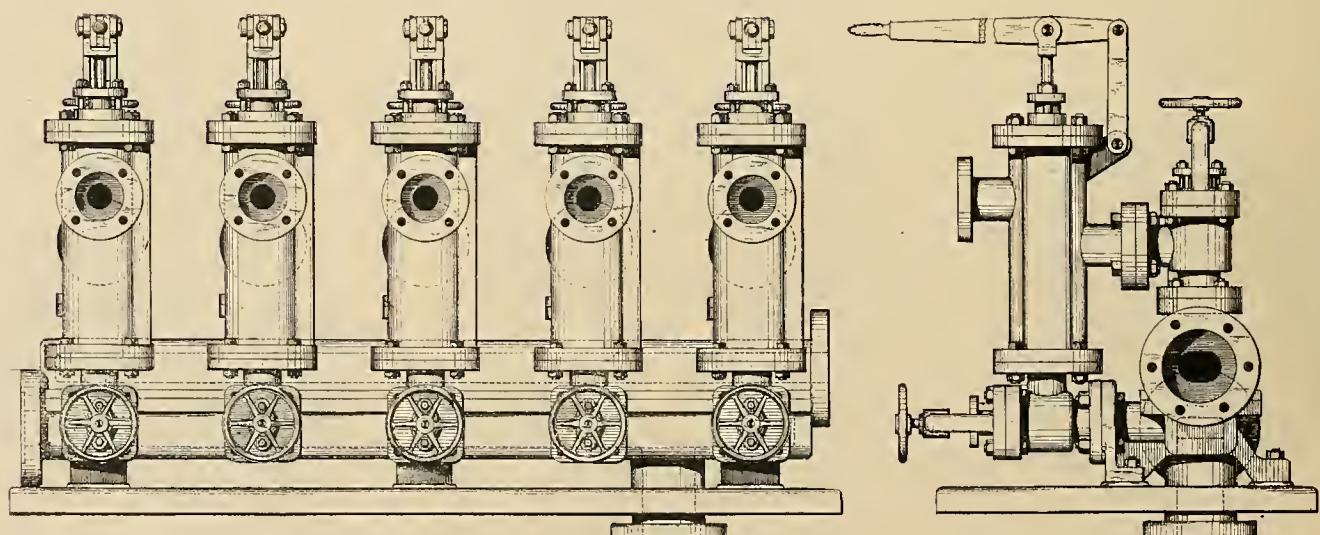


FIG. 430.

Detail Drawings on Application.

IRON CASE.

GAUGES.

BRASS CASE.

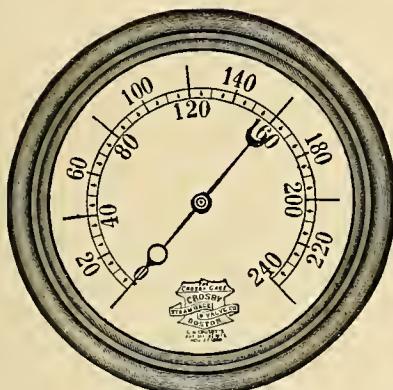


FIG. 431.  
STEAM GAUGE.

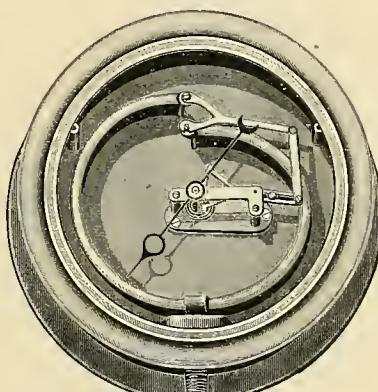


FIG. 432.  
SECTION.

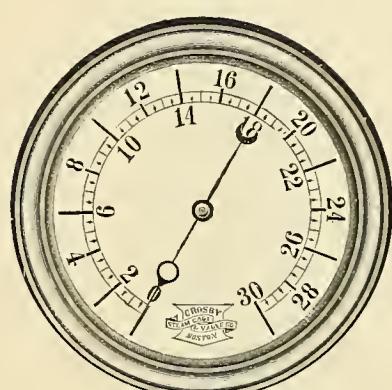


FIG. 433.  
VACUUM GAUGE.

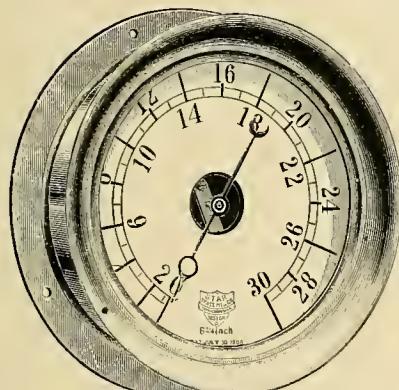


FIG. 434.  
BLAST GAUGE.

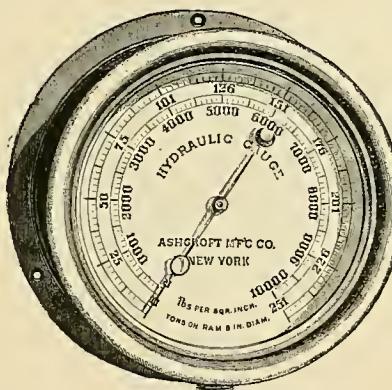


FIG. 435.  
HYDRAULIC GAUGE.

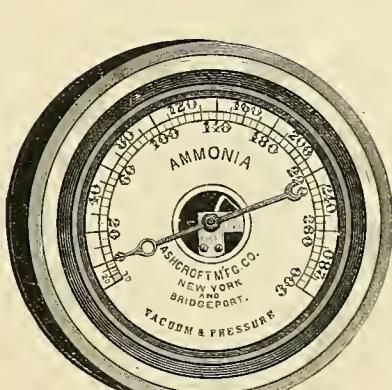


FIG. 436.  
AMMONIA GAUGE.

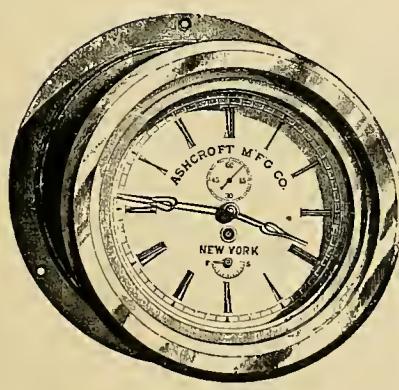


FIG. 437.  
CLOCK.



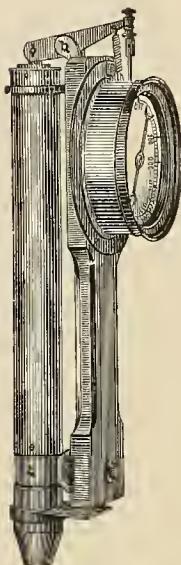
FIG. 438.  
REVOLUTION INDICATOR.  
ROUND CASE.



FIG. 439.  
REVOLUTION INDICATOR.  
SQUARE CASE.

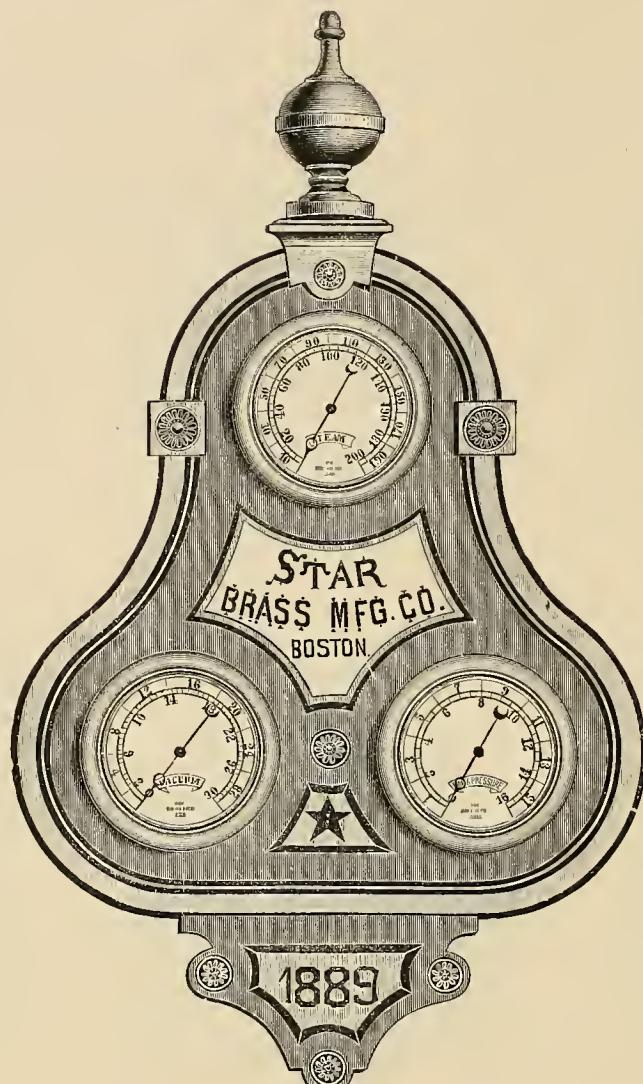


FIG. 440.  
SYPHON FOR STEAM GAUGES.

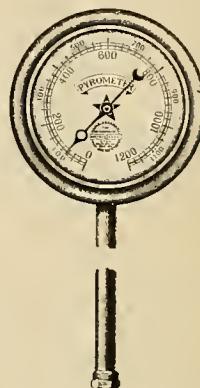


**BROWN'S HOT BLAST PYROMETER.**

PORTABLE.

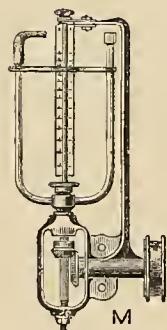


**FIG. 442.**  
**FRAME FOR GAUGES.**

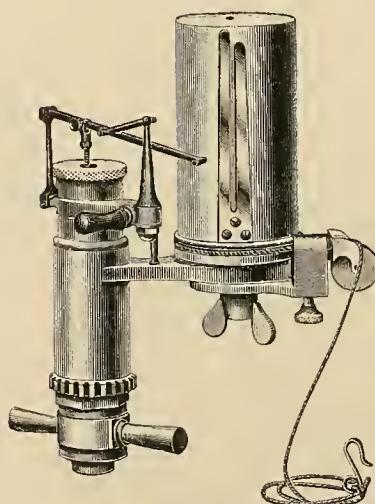


**HOT BLAST PYROMETER.**

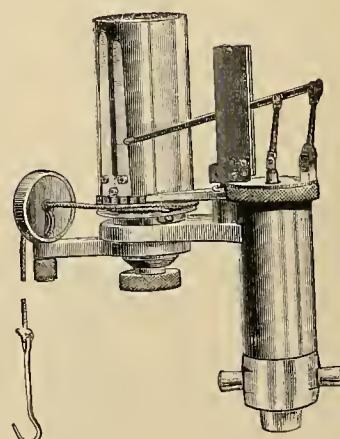
STATIONARY.



**REVOLUTION INDICATOR.**



**THOMPSON IMPROVED INDICATOR.**



**TABOR IMPROVED INDICATOR.**

Descriptive Circulars on application.

SHAW'S MERCURY GAUGES.

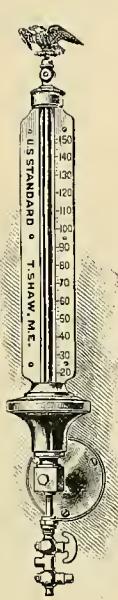


FIG. 448.  
STEAM GAUGE.  
BRASS CASE.

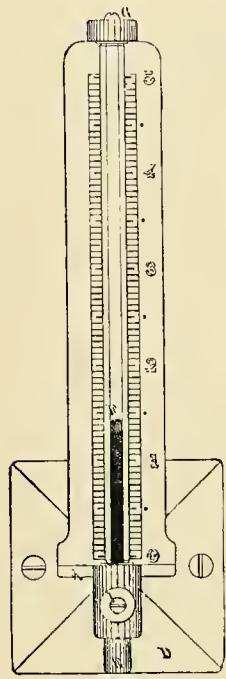


FIG. 449.  
IRON GAUGE  
FOR BLAST PRESSURE  
AND NATURAL GAS.

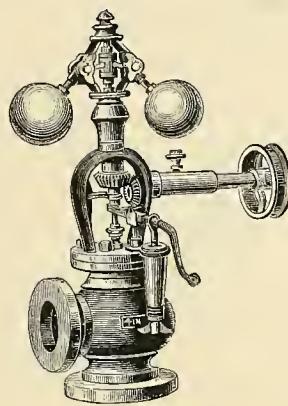


FIG. 450.  
JUDSON GOVERNOR.  
MEDIUM SPEED.

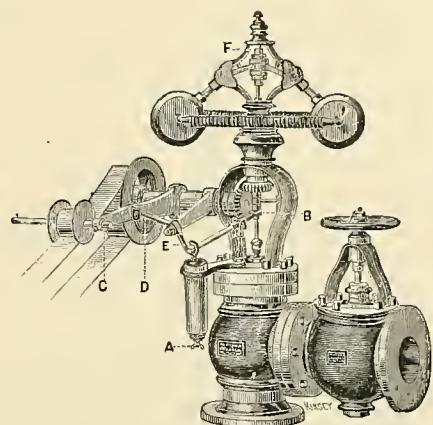


FIG. 451.  
JUDSON GOVERNOR.  
HIGH SPEED.

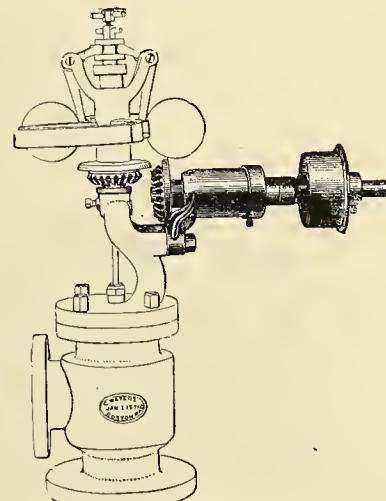


FIG. 452.  
WATERS GOVERNOR.  
AUTOMATIC-CLASS A.

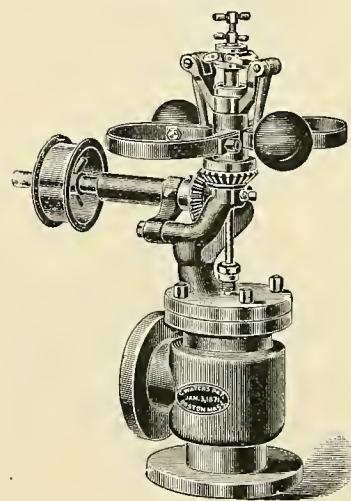


FIG. 453.  
WATERS GOVERNOR.  
CLASS B.

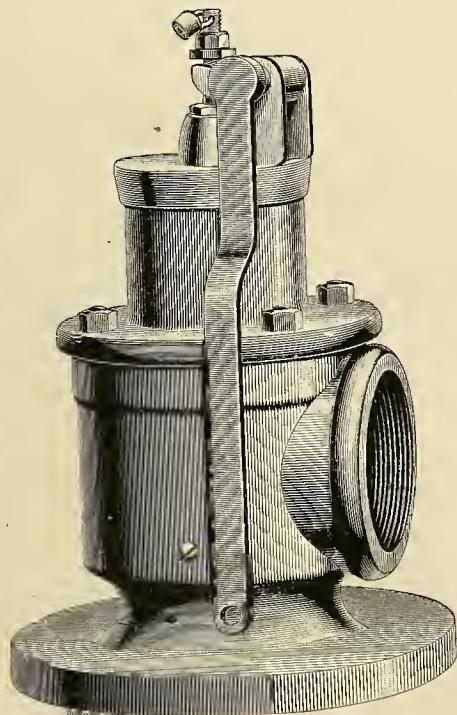


FIG. 454.  
ASHTON POP SAFETY VALVE.

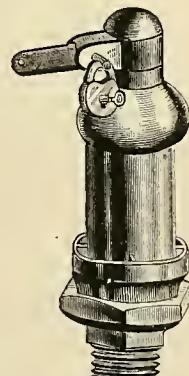


FIG. 455.  
CROSBY POP SAFETY  
VALVE.  
SCREWED AND FLANGED.

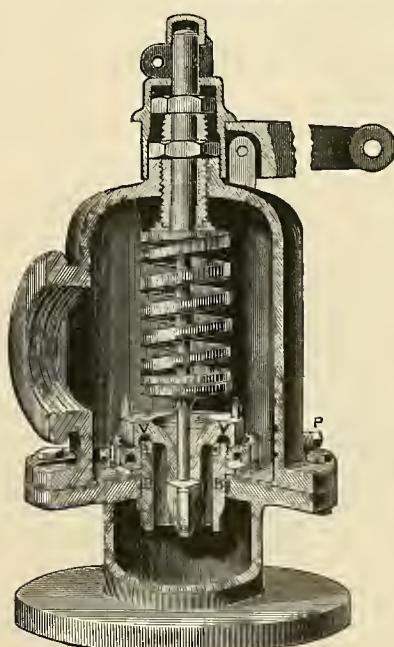


FIG. 456.  
CONSOLIDATED POP SAFETY  
VALVE.  
SCREWED AND FLANGED.

Governors or Pop Safety Valves of any Make Furnished.

## REGULATORS.

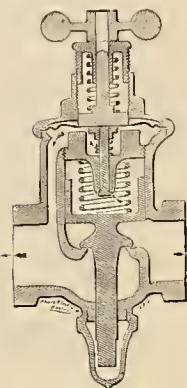


FIG. 457.  
CURTIS'  
FOR STEAM, WATER AND GAS.  
SECTION.

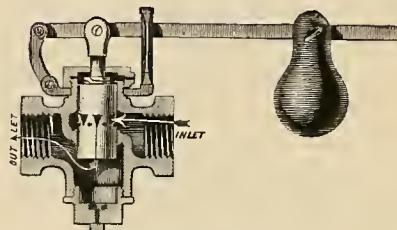


FIG. 458.  
WATSON'S  
FOR STEAM.

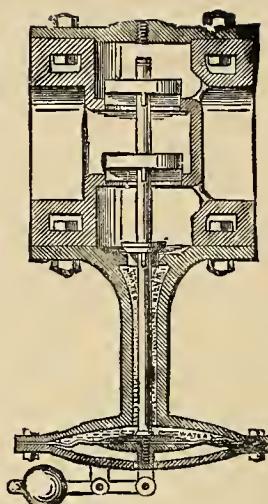


FIG. 459.  
EUREKA.  
FOR STEAM.

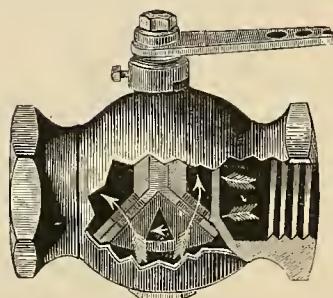


FIG. 460.  
FITTS' CHRONOMETER.  
AND REGULATOR VALVES.

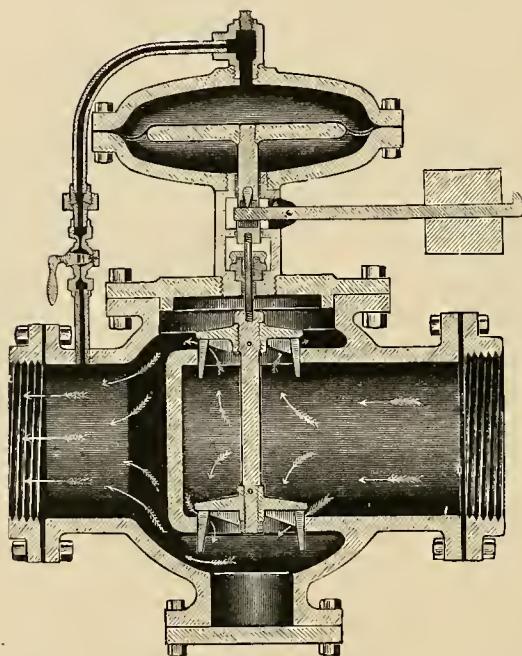


FIG. 461.  
CHAPMAN'S  
FOR NATURAL GAS.

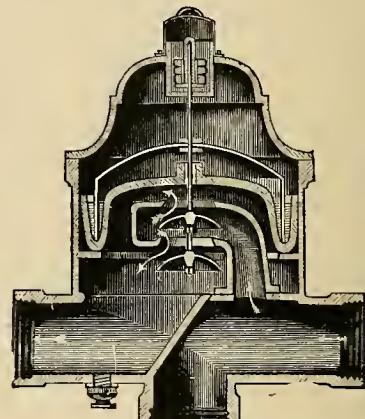


FIG. 462.  
STOTT'S LOW PRESSURE  
FOR ILLUMINATING AND NATURAL GAS

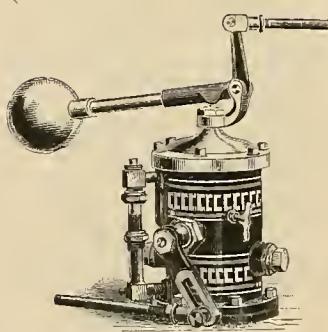


FIG. 463.  
PUMP GOVERNOR.  
MASON'S.

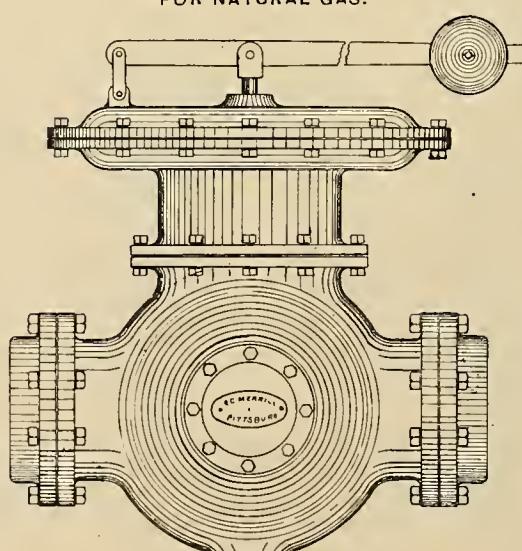


FIG. 464.  
MERRILL'S  
FOR NATURAL GAS.

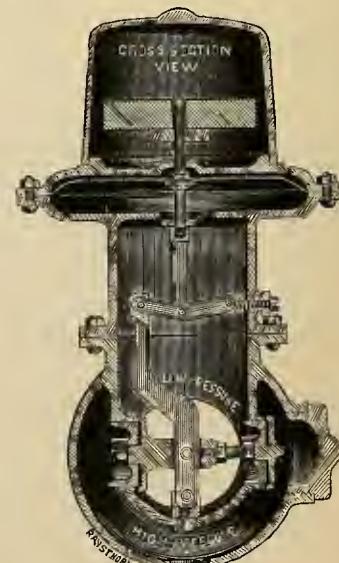


FIG. 465.  
MERRILL'S  
(SECTION.) FOR NATURAL GAS.

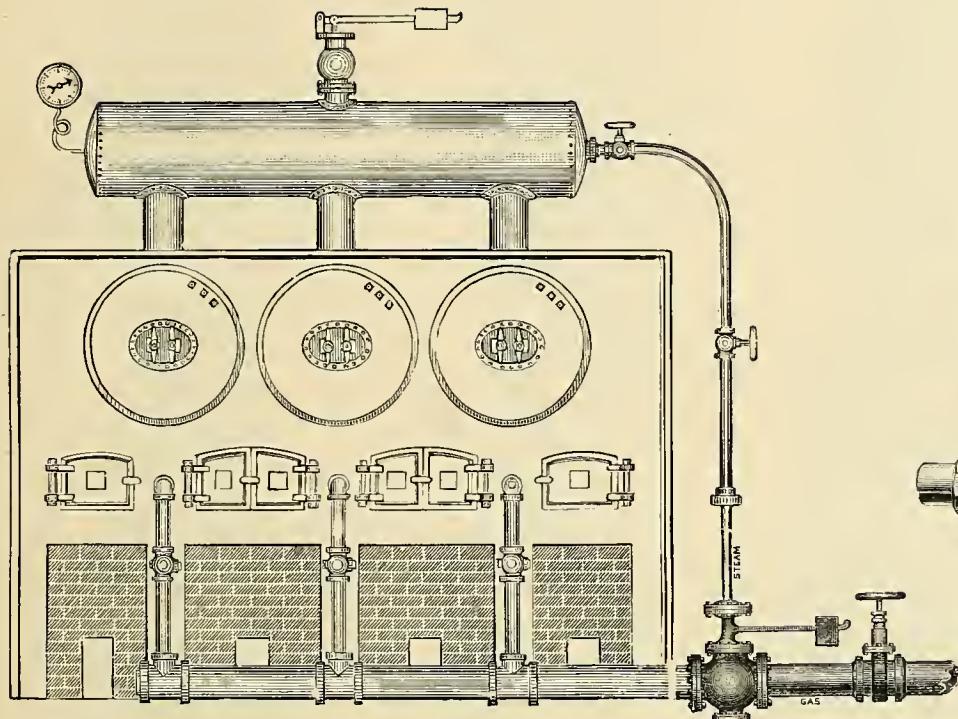


FIG. 466.  
FULTON NATURAL GAS REGULATOR FOR STEAM BOILERS.  
SHOWING BOILER REGULATOR AND CONNECTIONS.

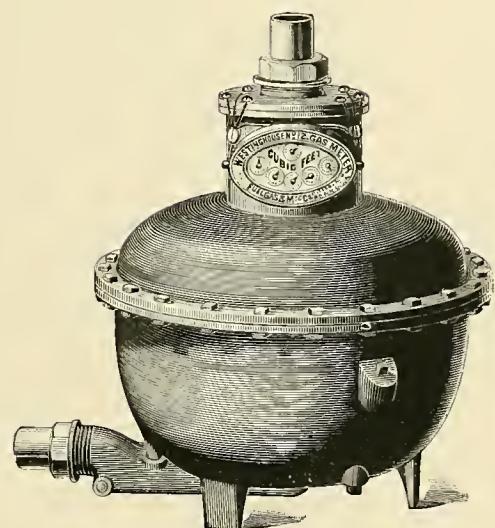


FIG. 467  
WESTINGHOUSE GAS METER.

## WATER METERS.



FIG. 468.  
CROWN.

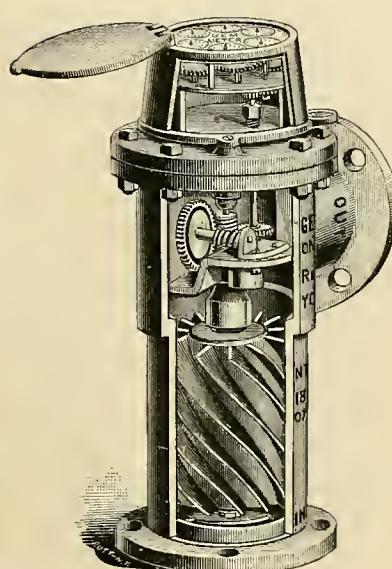


FIG. 469.  
GEM.

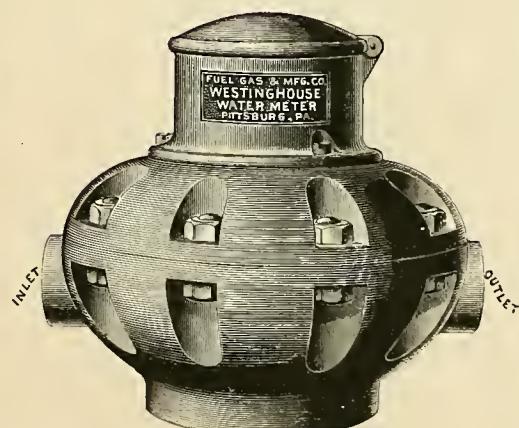


FIG. 470.  
WESTINGHOUSE

Descriptive Circulars on Application.

## NATIONAL WATER FILTER.

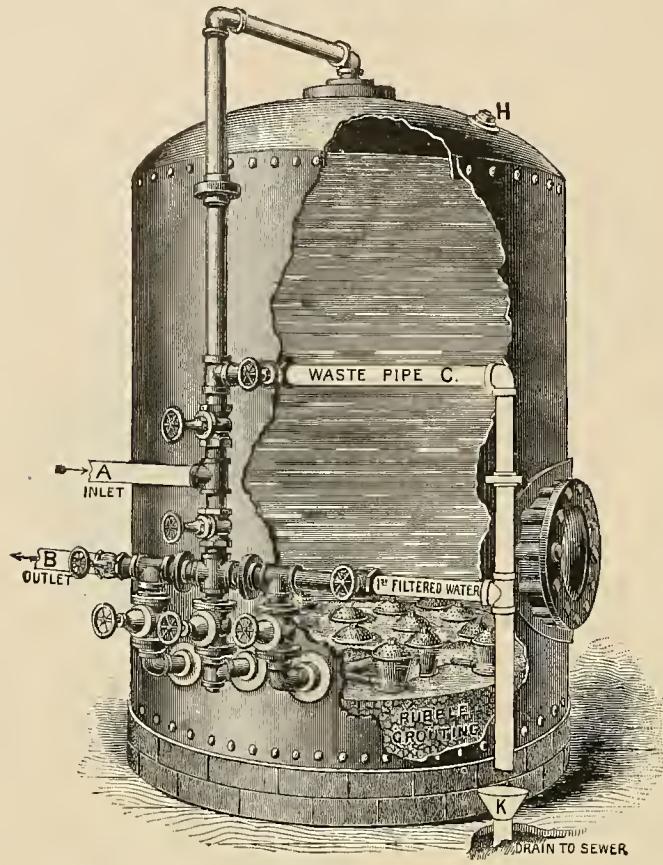


FIG. 471  
EXHAUST STEAM INDUCTION CONDENSER.

## MORGAN'S (EXTENSION) SHUT OFF BOXES.



FIG. 472.  
FOR COCKS.

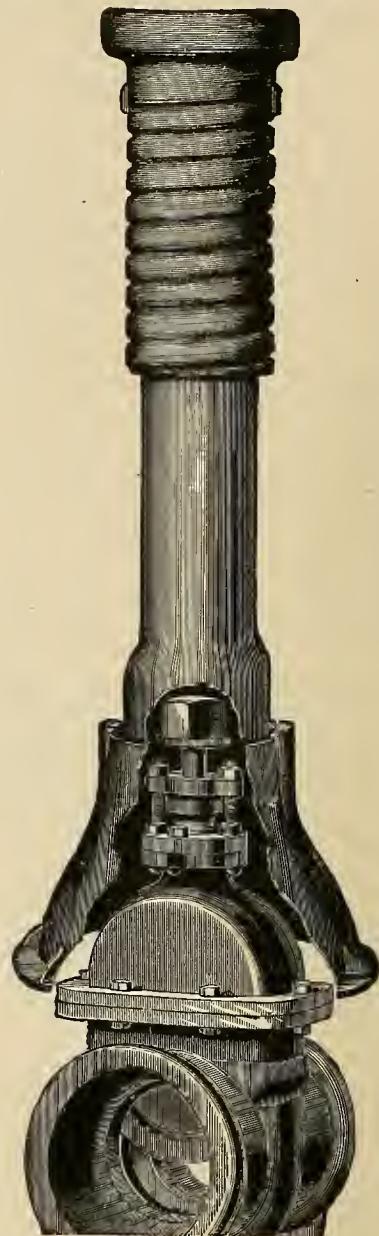


FIG. 473.  
FOR VALVES

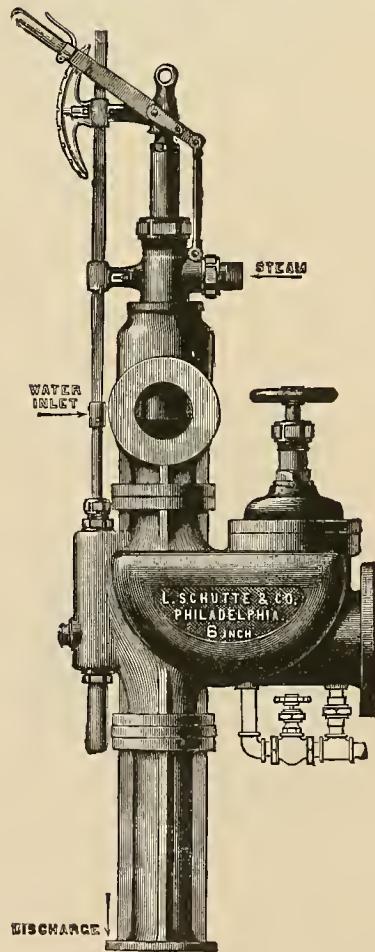


FIG. 474.  
ADJUSTABLE.

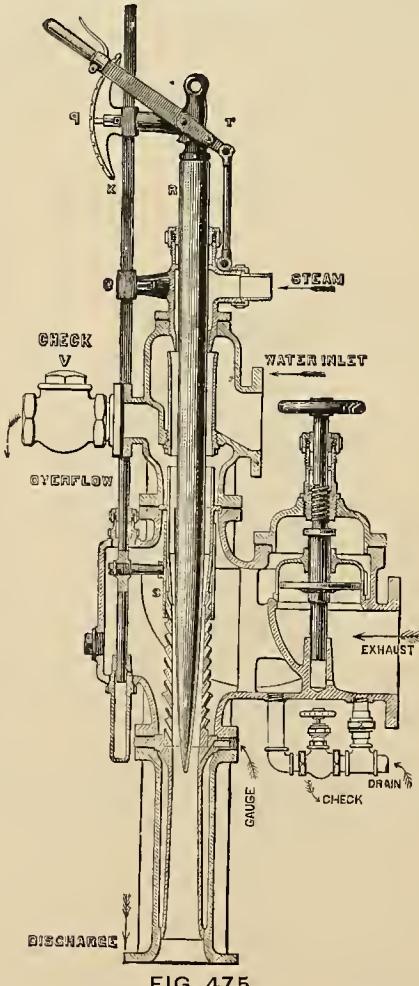


FIG. 475.  
SECTION.

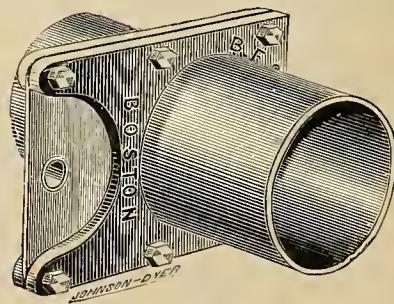
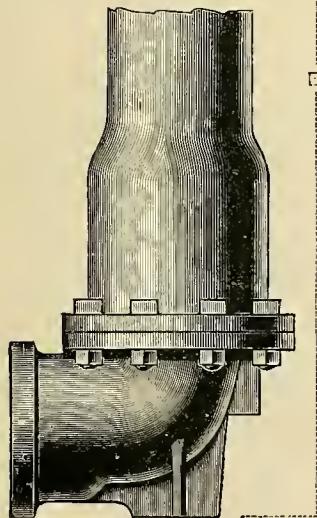
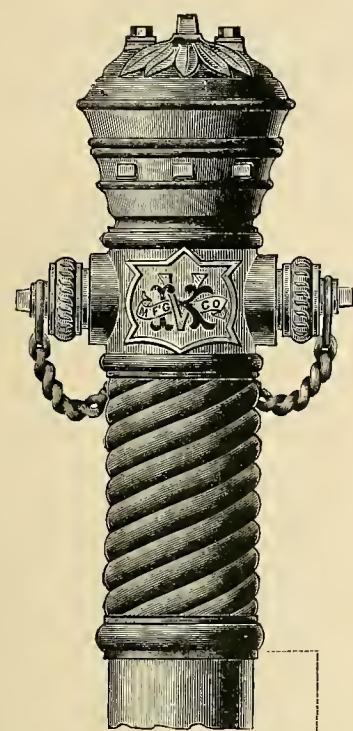


FIG. 476.  
BLAST GATE



J. KENNY, N.Y.  
FIG. 477.  
KENNEDY  
FIRE HYDRANT.  
FROM 1 TO 4 OUTLETS.

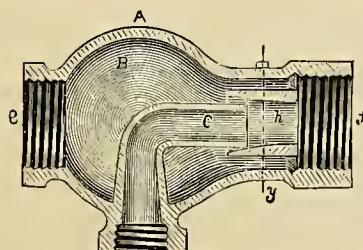


FIG. 482.  
SYPHON PUMP.

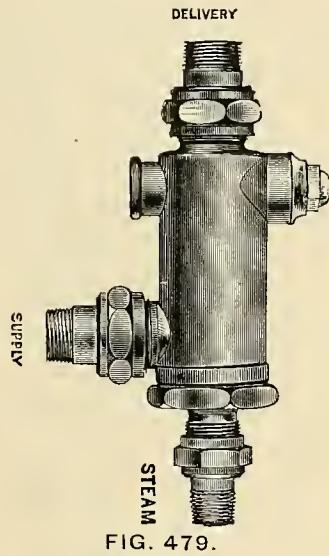


FIG. 479.  
GARFIELD  
INJECTOR.

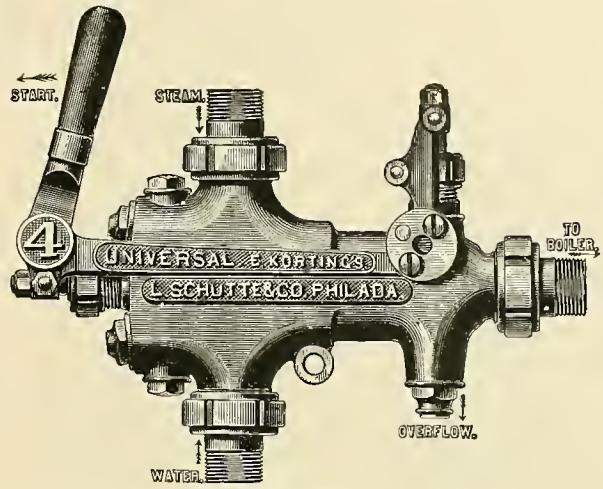


FIG. 480.  
UNIVERSAL INJECTOR.  
DOUBLE TUBE.



FIG. 478.  
LEWIS  
HYDRANT

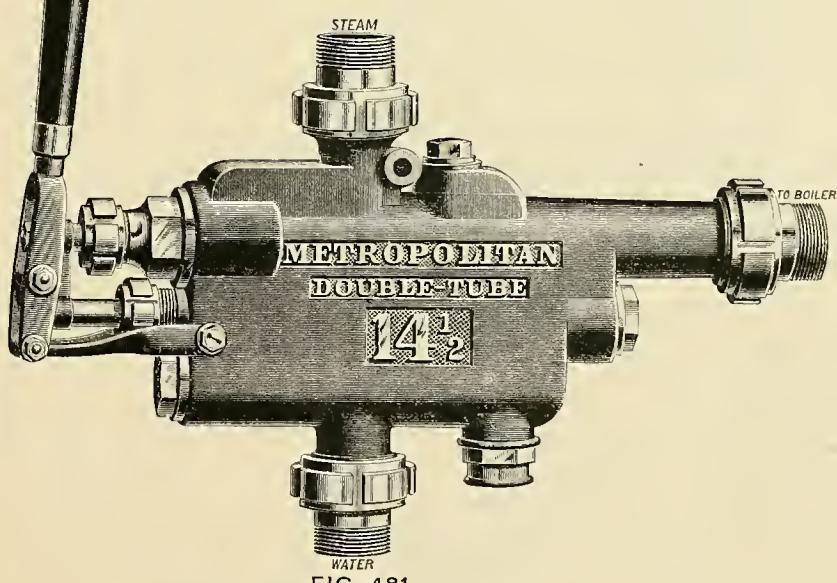


FIG. 481.  
METROPOLITAN INJECTOR.  
DOUBLE TUBE.

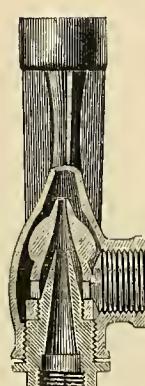


FIG. 483.  
DEFIANCE EJECTOR  
OR PUMP.

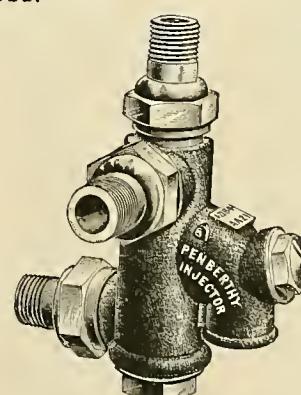


FIG. 484.  
PENBERTHY  
INJECTOR.

Descriptive Circulars on application.

## CLIMAX STEAM SEPARATORS.

SCREWED OR FLANGED. For Pipe from 2 in. to 12 in. Diameter.

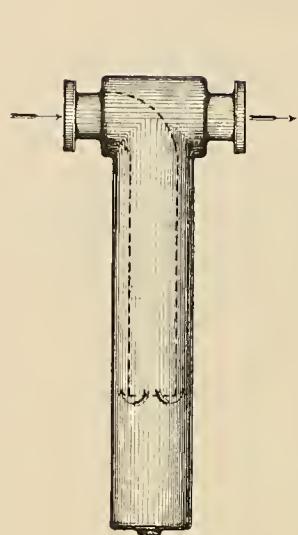


FIG. 485.

FOR HORIZONTAL LINE.

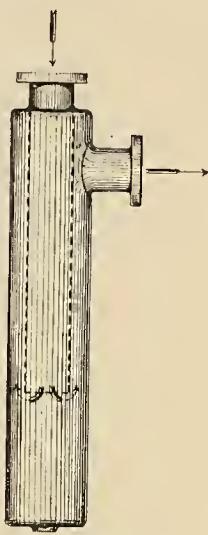


FIG. 486.

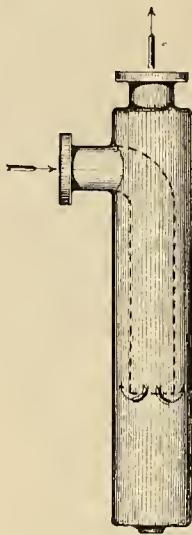
FROM VERTICAL  
TO HORIZONTAL LINE.

FIG. 487.

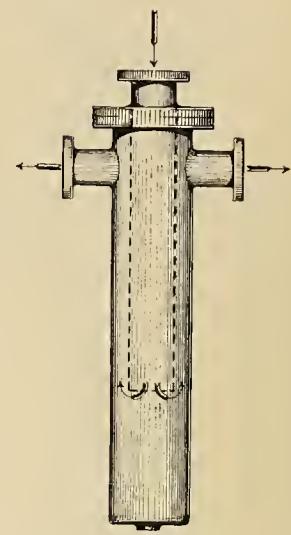
FROM HORIZONTAL  
TO VERTICAL LINE.

FIG. 488.

THREE WAY  
FROM VERTICAL TO 2  
HORIZONTAL LINES.

## SPRAY HEATERS.

ALL SIZES.

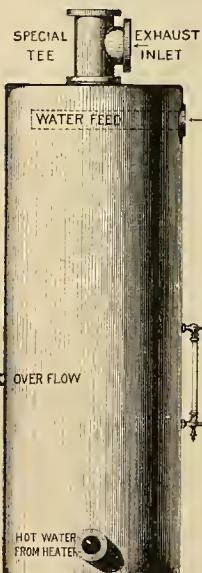


FIG. 490.

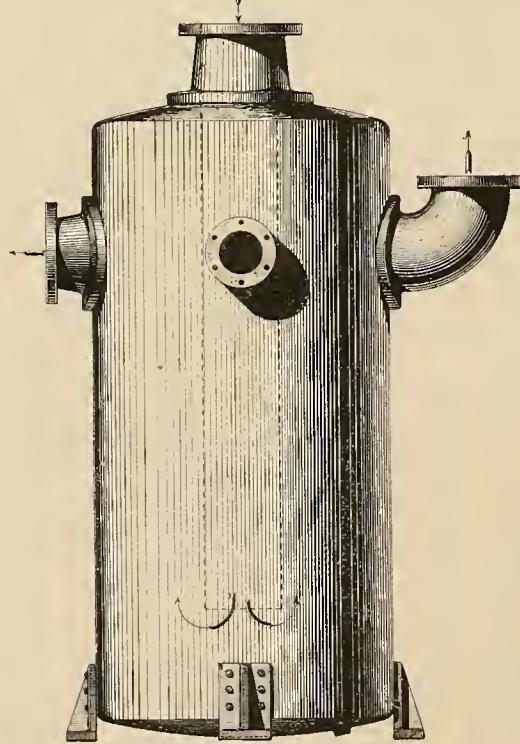
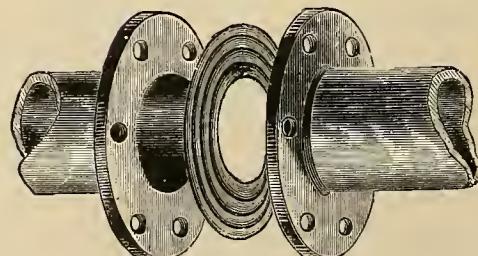


FIG. 489.

FIG. 491.  
CORRUGATED COPPER GASKETS  
OF ANY SIZE OR SHAPE.

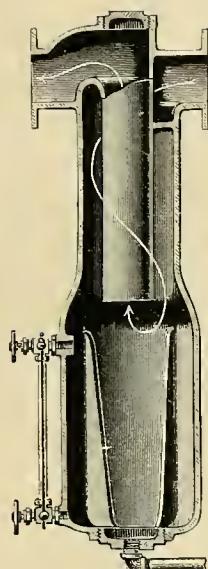


FIG. 492.  
STEAM SEPARATOR.  
STRATTON'S.

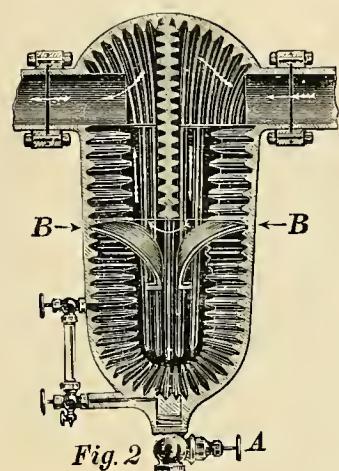


FIG. 493.  
STEAM SEPARATOR.  
HINES'.

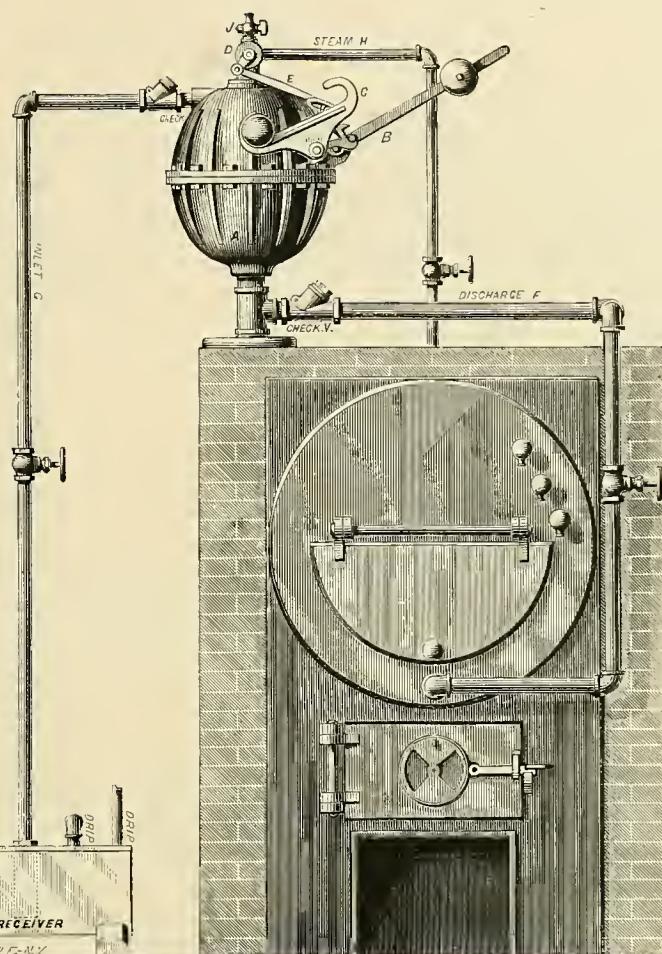


FIG. 494.  
PRATT'S PAT. RETURN STEAM TRAP  
FOR RETURNING WATER TO BOILER.

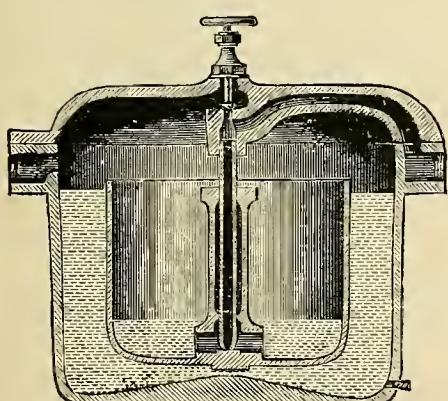


FIG. 495.  
IMPROVED STEAM TRAP.  
SECTION.

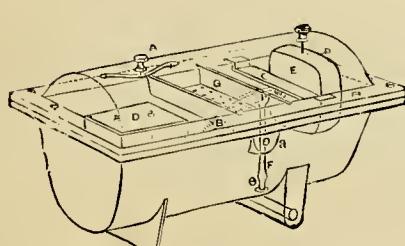


FIG. 496.  
CHAPMAN STEAM TRAP  
WITH SOAPSTONE FLOAT.

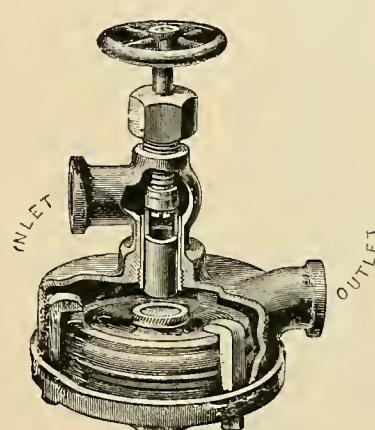


FIG. 497.  
STANDARD EXPANSION  
STEAM TRAP.

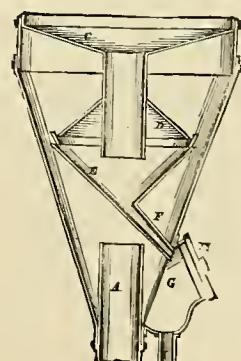


FIG. 498  
CONDENSER HEADS  
FOR EXHAUST STEAM.  
ANY MAKE.

Descriptive Circulars on Application.

## FEED WATER HEATERS.

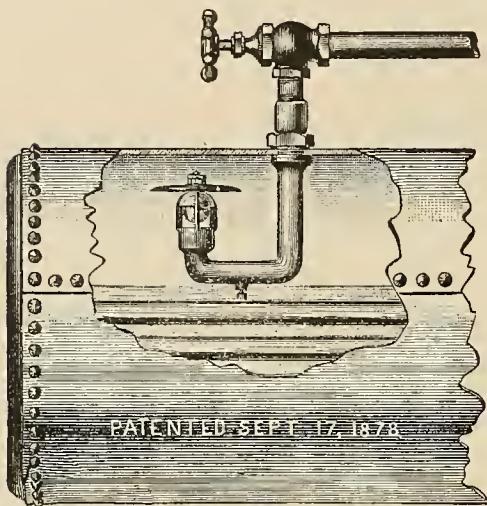


FIG. 499.  
CHAMPION.  
MOORE'S PATENT.

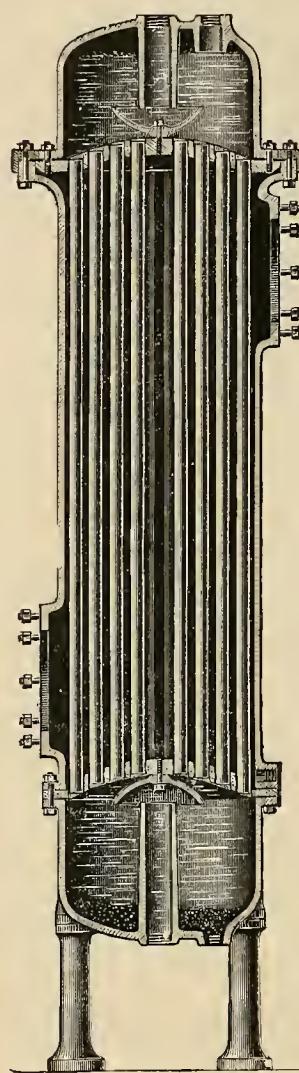


FIG. 501  
GOUBERT HEATER.

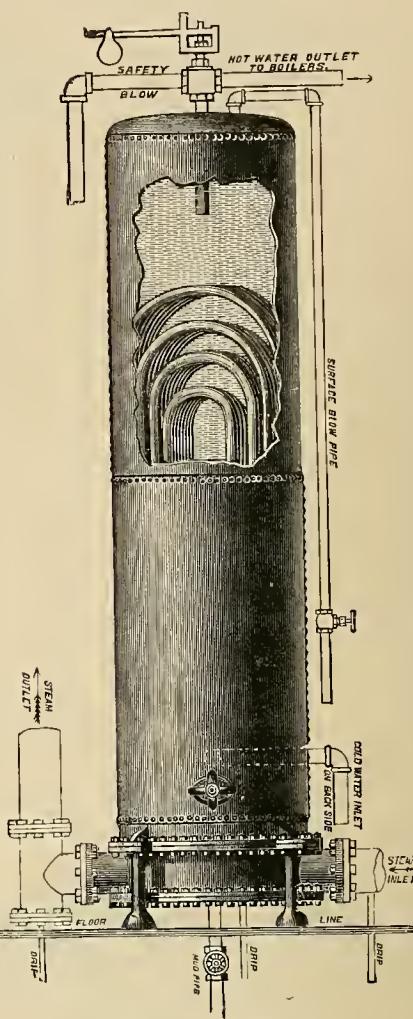


FIG. 502.  
BERRYMAN HEATER AND  
PURIFYER.

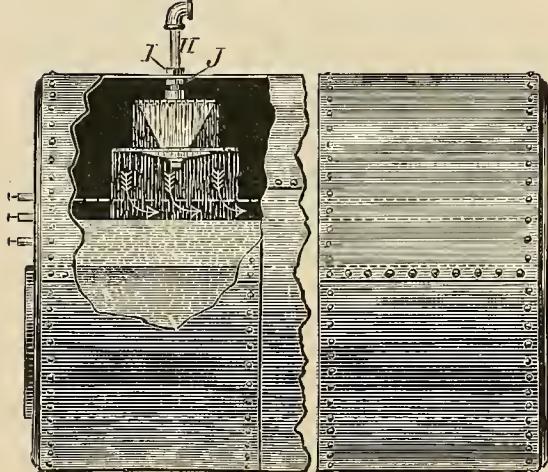
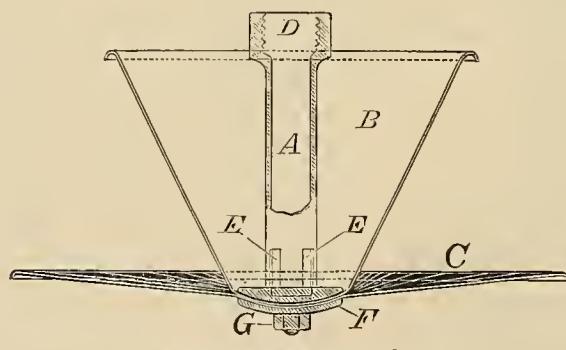


FIG. 500.  
FORD'S PATENT.



ENLARGED SECTION OF  
FORD'S PATENT HEATER.

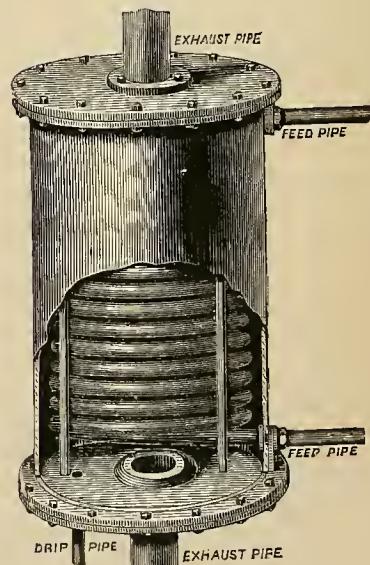


FIG. 503.  
NATIONAL FEED WATER HEATER.

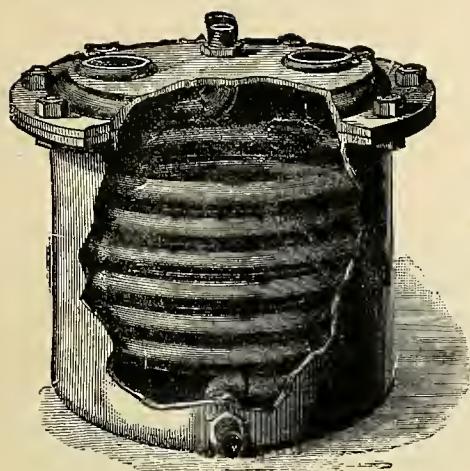


FIG. 504.  
CAST IRON HEATER  
WITH IRON PIPE COIL.

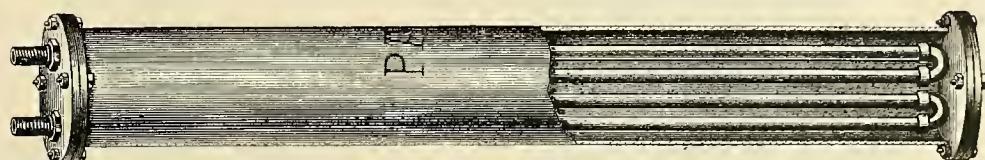


FIG. 505.  
FEED WATER HEATER.  
WITH RETURN BEND COIL.



FIG. 506.  
MANIFOLD HEATER  
FOR DRYING LUMBER, ETC. (WROUGHT IRON HEADERS.)

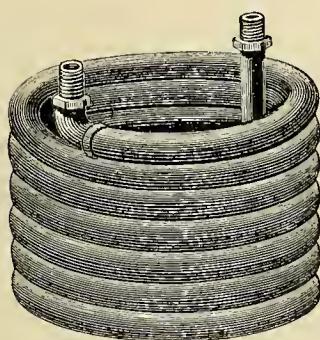


FIG. 507.  
HEATER COILS.  
IRON, BRASS OR COPPER PIPE.

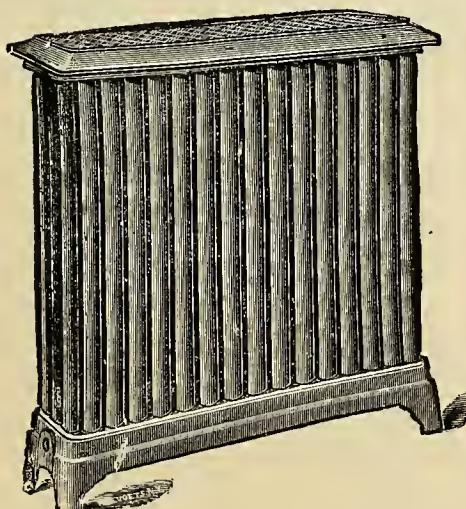


FIG. 508.  
WROUGHT IRON  
TUBE RADIATOR.

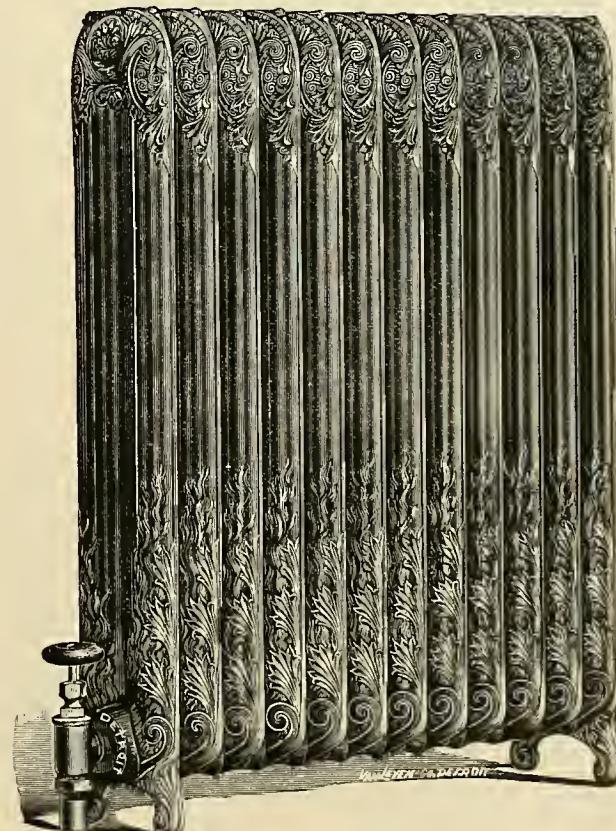


FIG. 509.  
CAST IRON RADIATOR.  
PERFECTION.

Descriptive Circulars on Application.

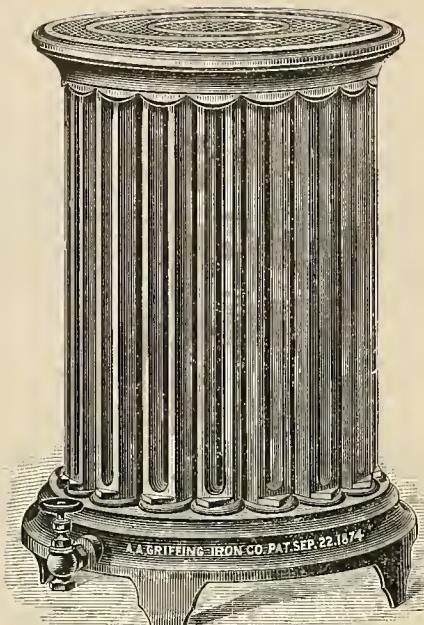


FIG. 510.  
BUNDY CIRCULAR  
RADIATOR.

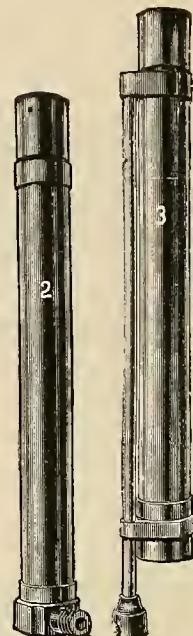


FIG. 511.  
AUTOMATIC  
AIR VALVES.

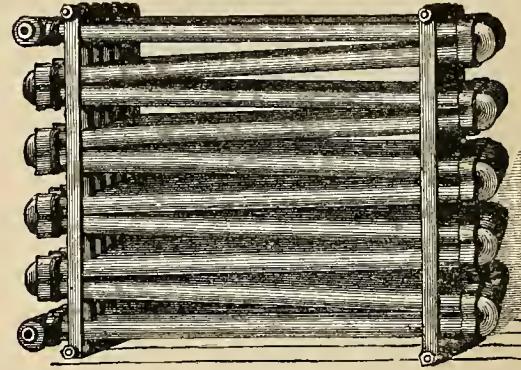


FIG. 512.  
BOX COILS.

FIG. 513.  
WALL COILS.  
1-1/4-1-1/2-AND 2 INCH. PIPE,  
WITH HEADERS FROM 1/4 TO 8 INCH. DIAM.  
See Table, page 103.

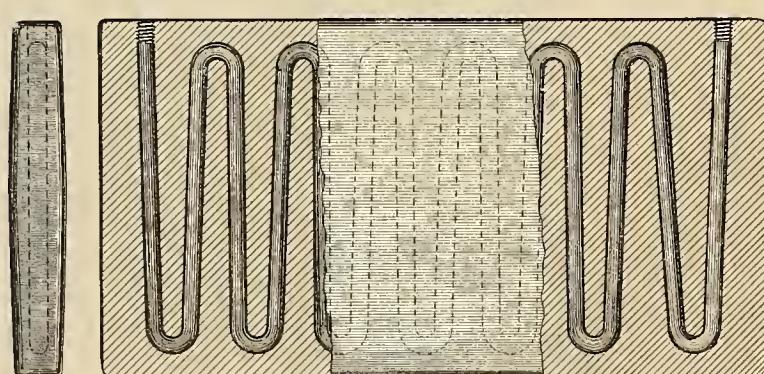
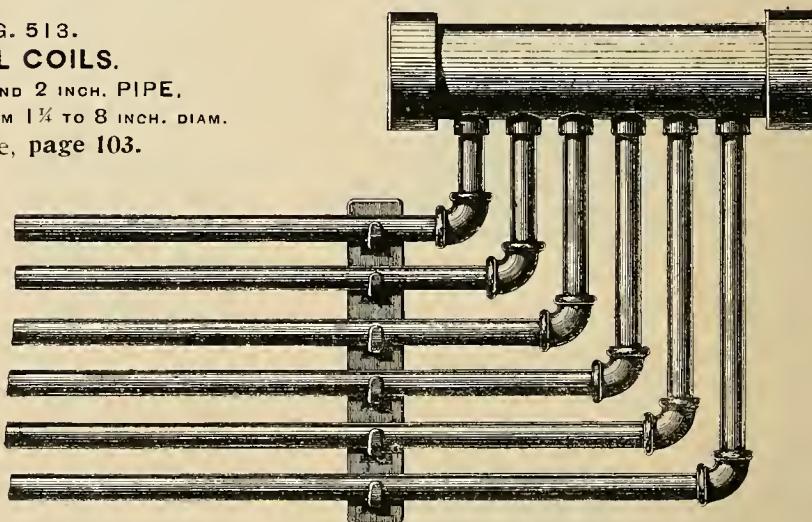
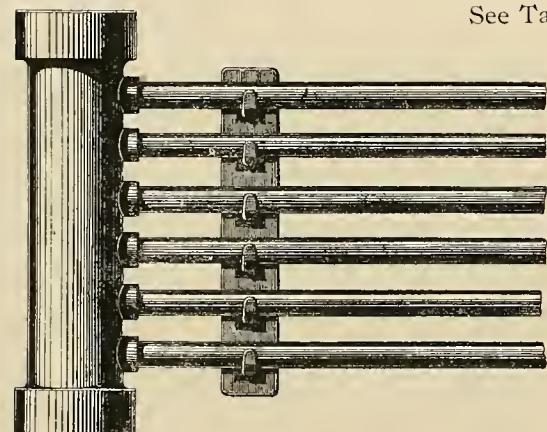


FIG. 514.  
STEAM SUPER-HEATER.

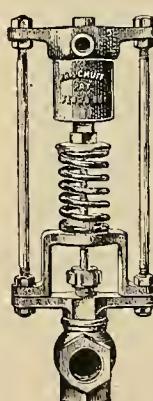


FIG. 515.  
SCHUFFS'  
STEAM PRESSURE REGULATOR.

Descriptive Circulars on application.

## LOCKE'S DAMPER REGULATORS.

AT LEAST 10 PER CENT. SAVING IN FUEL GUARANTEED.

NO STUFFING BOXES OR PACKING.

NO DIAPHRAGM.

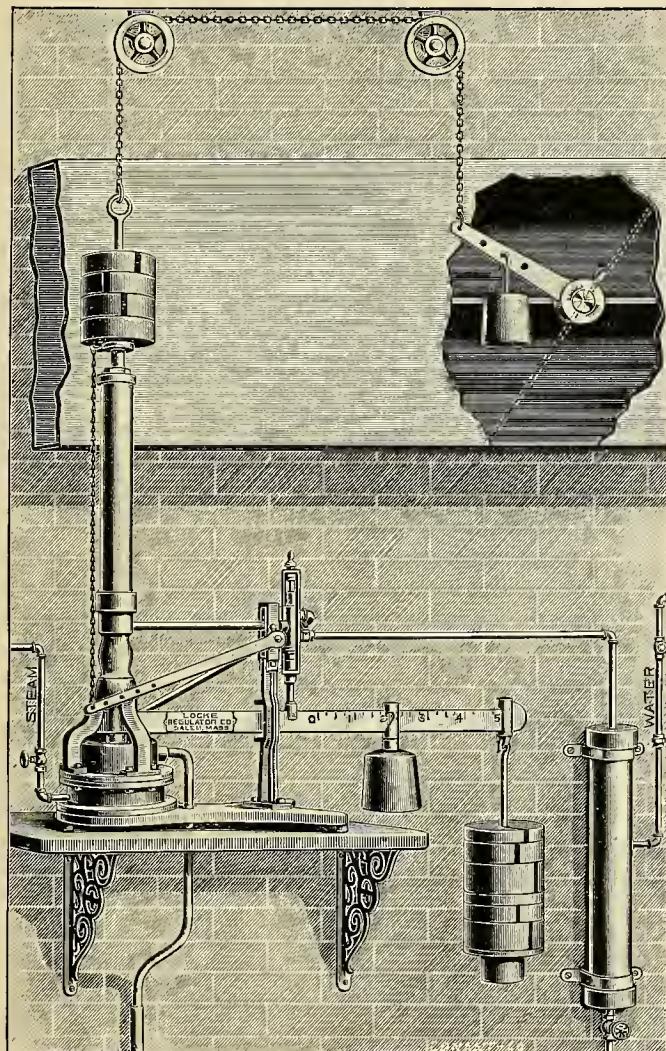


FIG. 516.

## WARRANTED

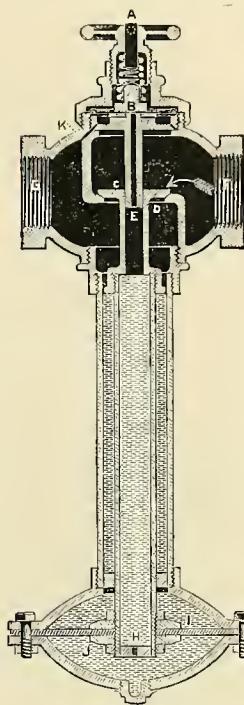
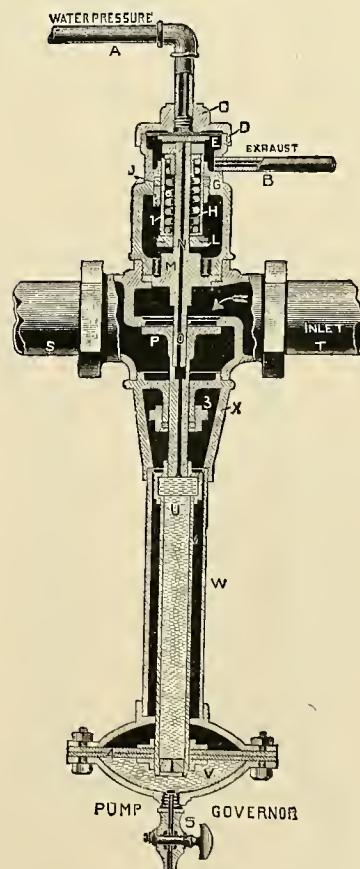
TO OPERATE DAMPERS WITH VARIATION OF  $\frac{1}{8}$  LB.

STEAM PRESSURE, AND TO

FULLY CLOSE OR OPEN DAMPER WITH VARIATION OF 1 LB.

SOLD SUBJECT TO 30 DAYS TRIAL.

OVER 4000 OF LOCKE'S DAMPER REGULATORS IN USE.

FIG. 517.  
LOCKE'S (BEATS ALL)  
PRESSURE REDUCING VALVE.FIG. 518.  
LOCKE'S (BEATS ALL)  
PUMP GOVERNOR.

## HEAVY IRON LAMPS. (Brazed)

FOR MILLS AND BLAST FURNACES.

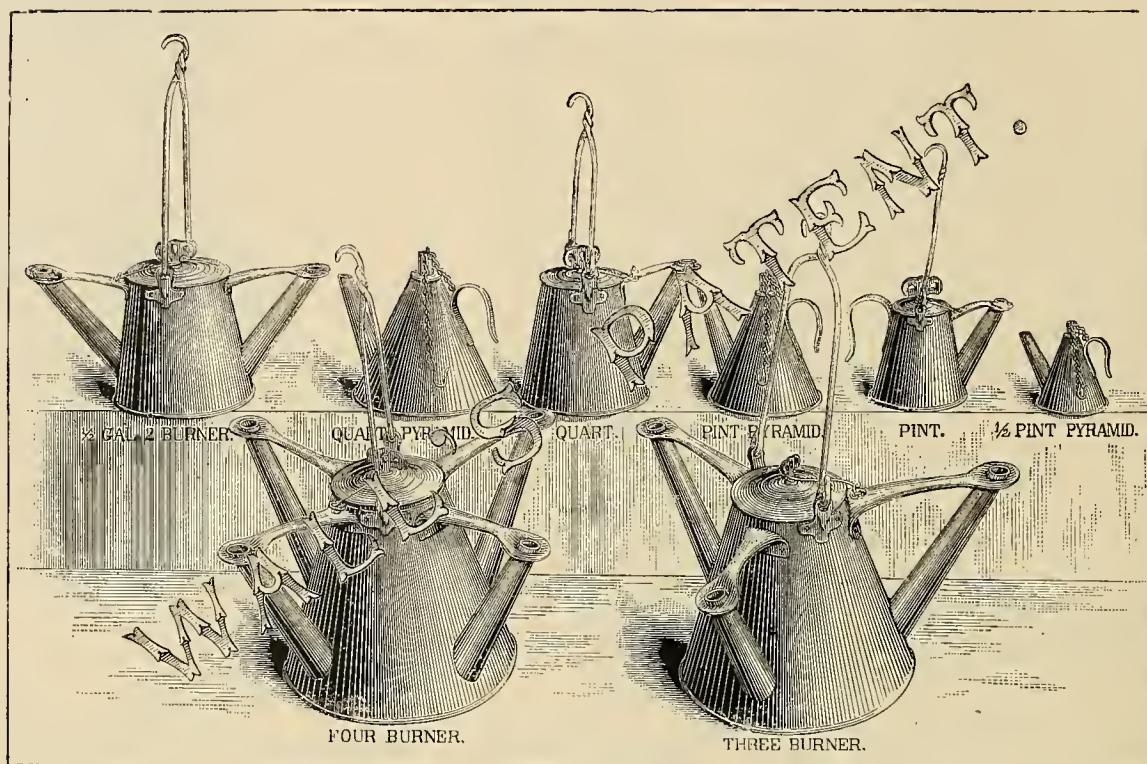


FIG. 519.

## BLAKE'S PIPE HANGERS.



FIG. 520.

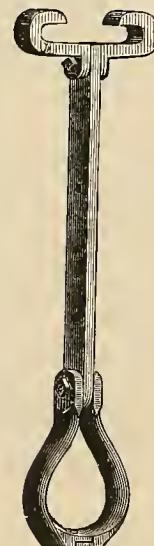


FIG. 521.



FIG. 522.



FIG. 523.

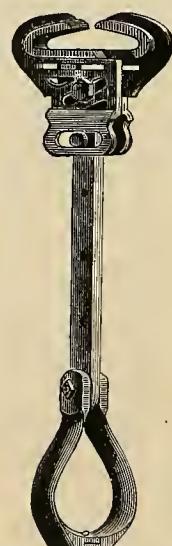


FIG. 524.



FIG. 525.

Descriptive Circular on Application.



FIG. 526.  
**PULLEY BLOCKS.**  
WESTON'S.

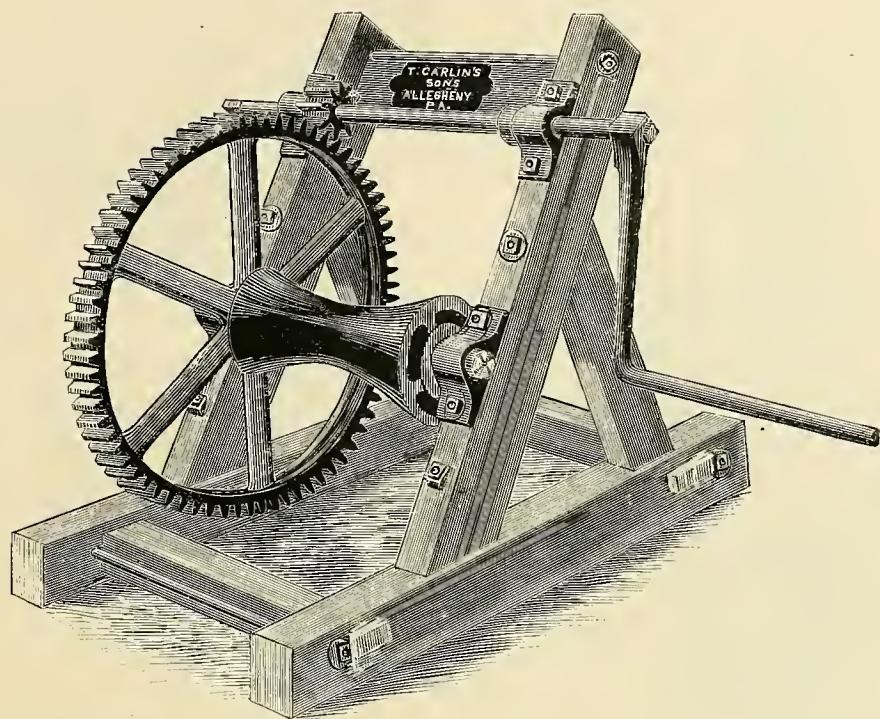


FIG. 527.  
**WINDLASS OR CRAB.**

**TACKLE BLOCKS.**

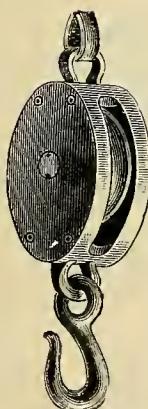


FIG. 528.  
SINGLE.

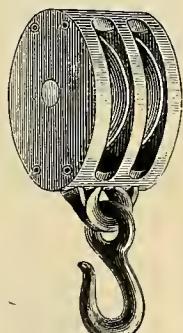


FIG. 529.  
DOUBLE.

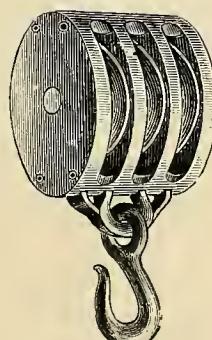


FIG. 530.  
TRIPLE.

**WIRE ROPE**

FIG. 531.  
**STEEL WIRE ROPE.**  
ALL SIZES.

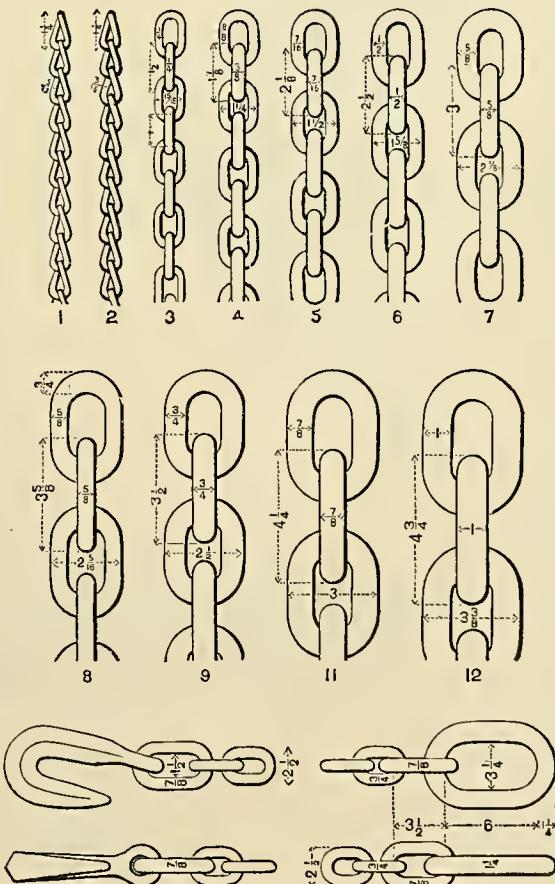


FIG. 532.  
**TESTED CHAIN.**  
ALL SIZES.

All Sizes—Wire, Manilla and Cotton Rope and Chain.



FIG. 533.  
JACK SCREWS.

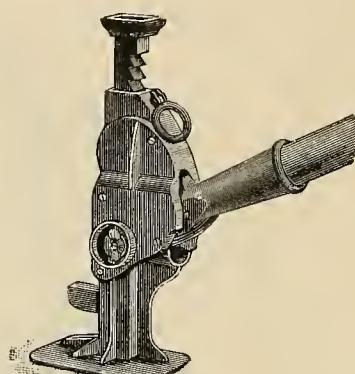


FIG. 534.  
RATCHET JACK.

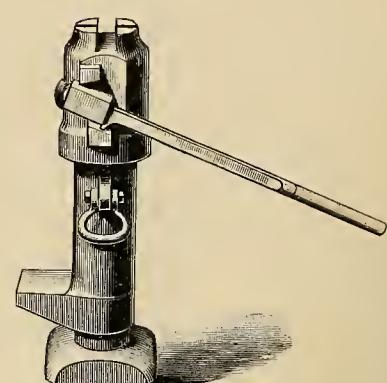


FIG. 535.  
HYDRAULIC JACK.

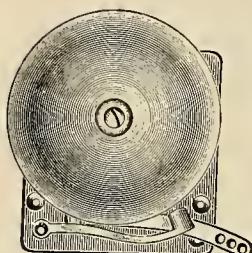


FIG. 536.  
TRIP GONG.  
FROM 3 IN. TO 18 IN. DIAM.

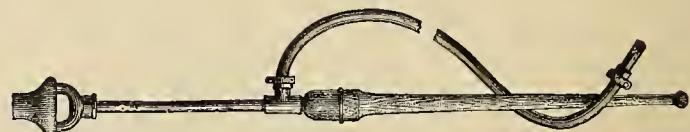
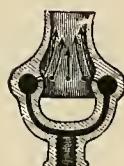


FIG. 539.  
BOILER TUBE CLEANER.  
CRIMMS' PATENT.

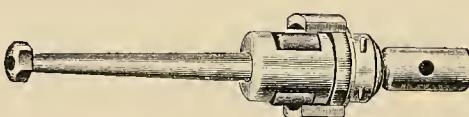


FIG. 537.  
ROLLER TUBE EXPANDER.  
HENDERER'S PATENT.

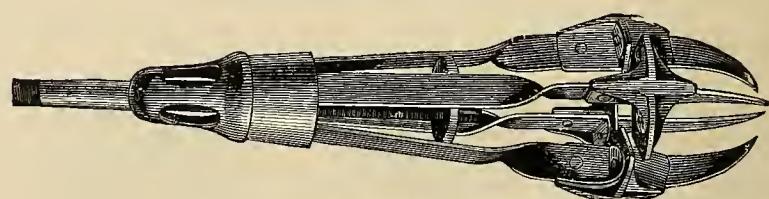


FIG. 540.  
NATIONAL TUBE CLEANER.

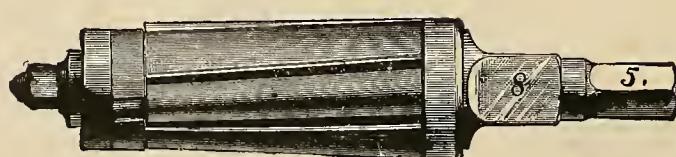


FIG. 538.  
ROLLER TUBE EXPANDER.  
COLLINS' PATENT.

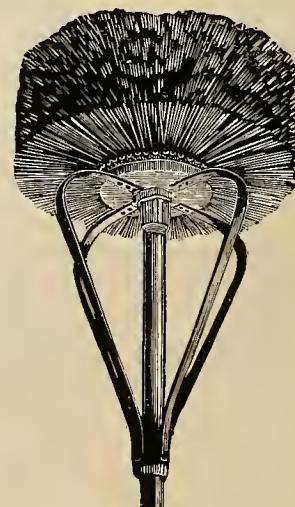


FIG. 541.  
STEEL WIRE FLUE BRUSH.

All Styles of Flue Cleaners.

## SHAFTING—COLD ROLLED OR COLD DRAWN.

FROM 1-4 IN. TO 4 IN.

IRON.



STEEL.



FIG. 542.

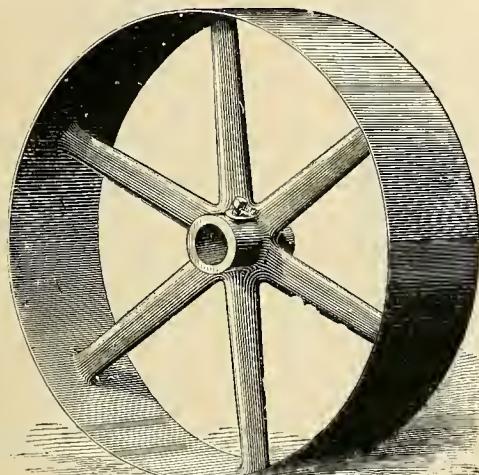


FIG. 543.

PLAIN PULLEY.

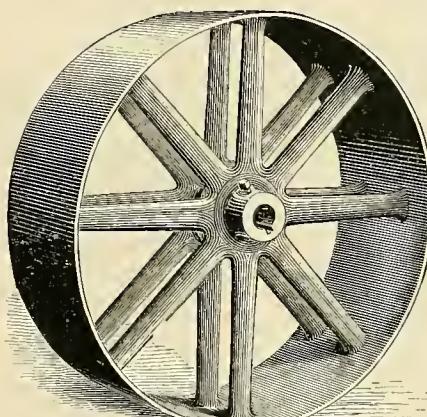


FIG. 544.

DOUBLE ARM PULLEY.

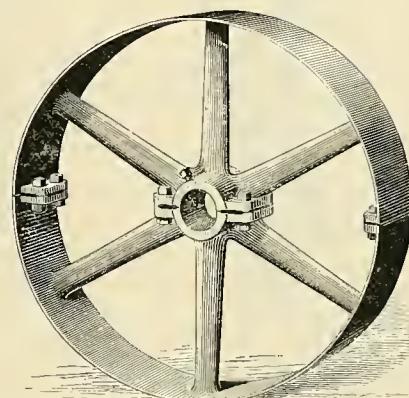


FIG. 545.

SPLIT PULLEY.

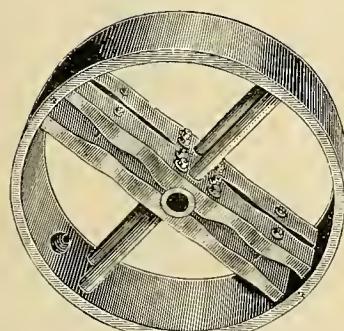


FIG. 546.

WOOD PULLEY.

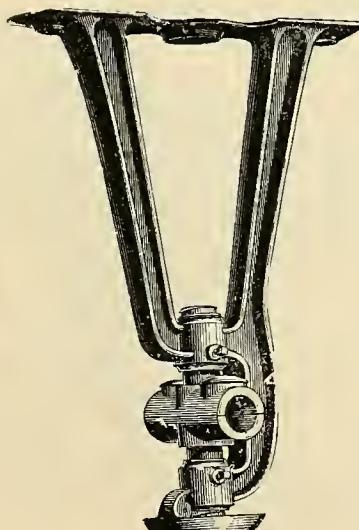


FIG. 547.

ADJUSTABLE HANGER.

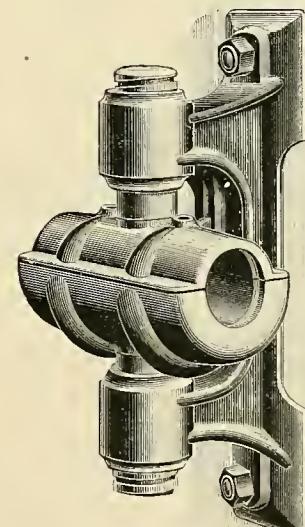


FIG. 548.

ADJST. POST HANGER.

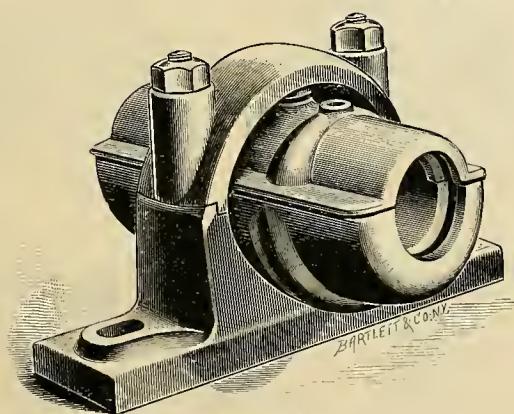


FIG. 549.

ADJST. PILLOW BLOCK.

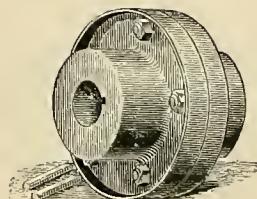


FIG. 550.

FLANGE COUPLINGS.



FIG. 551.

LOOSE COLLARS.

## MACHINE BOLTS, NUTS, ETC.

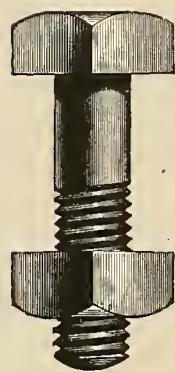


FIG. 552.

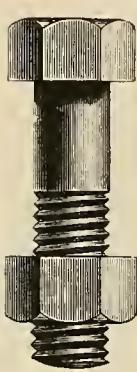


FIG. 553.

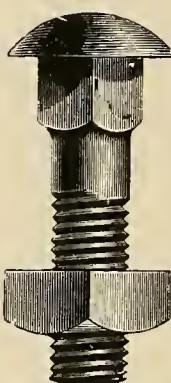


FIG. 554.

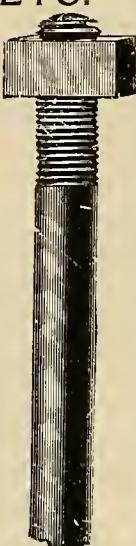


FIG. 555



FIG. 556.

BOLT WITH SQUARE HEAD AND NUT. BOLT WITH HEX. HEAD AND NUT. BOLT WITH BUTTON HEAD, SQ. NECK.

BOLT END.

WOOD OR LAG SCREW.

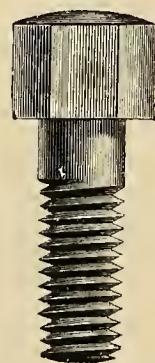
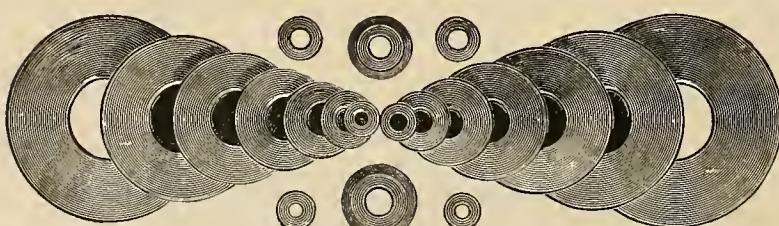
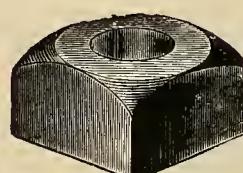
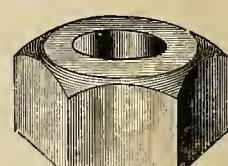
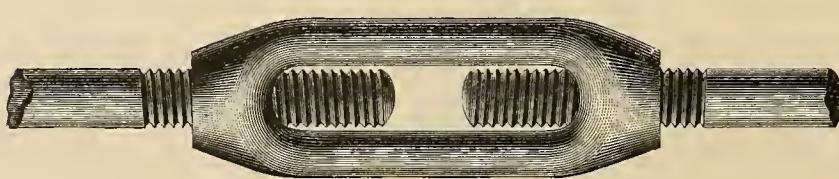
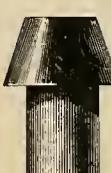
FIG. 557.  
STUD BOLT.FIG. 558.  
SET SCREW.  
SQUARE HEAD.FIG. 559.  
TAP BOLT.  
HEX. HEAD.FIG. 560.  
UPSET OR ENLARGED  
BOLT ENDS.FIG. 561.  
WASHERS  
WROUGHT OR CAST IRON.FIG. 563.  
SQUARE NUT.FIG. 564.  
HEX. NUTFIG. 562.  
TURN BUCKLES.  
DROP FORGED.

FIG. 565.



FIG. 566.

FIG. 567.  
BOILER AND TANK RIVETS.

## TOOLS FOR CUTTING AND FITTING PIPE.

## WALWORTH DIE PLATE OR STOCKS.

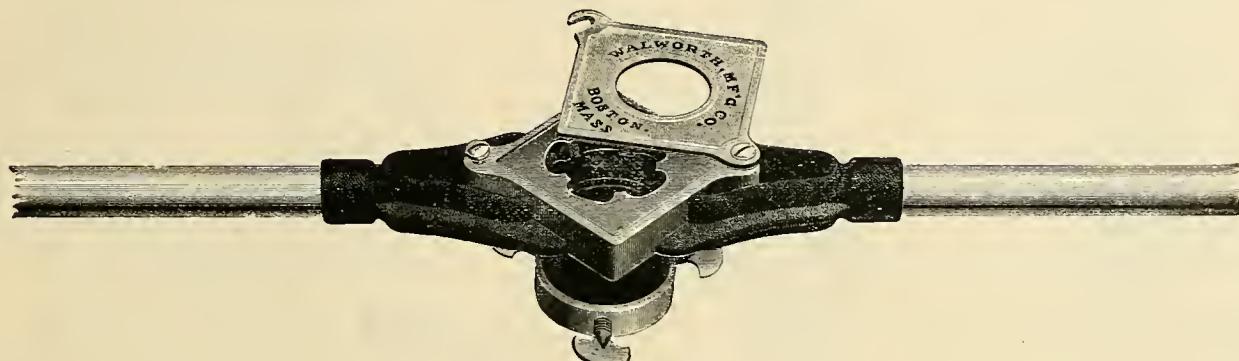


FIG. 568.

No. 1—Cuts from  $\frac{1}{4}$  to 1 or $\frac{1}{8}$  to 1 inch.No. 2—Cuts from  $1\frac{1}{4}$  to 2 or $\frac{3}{4}$  to 2 inch.

Separate Dies furnished when so ordered.

## MILLER'S REVERSIBLE RATCHET DIE PLATE.

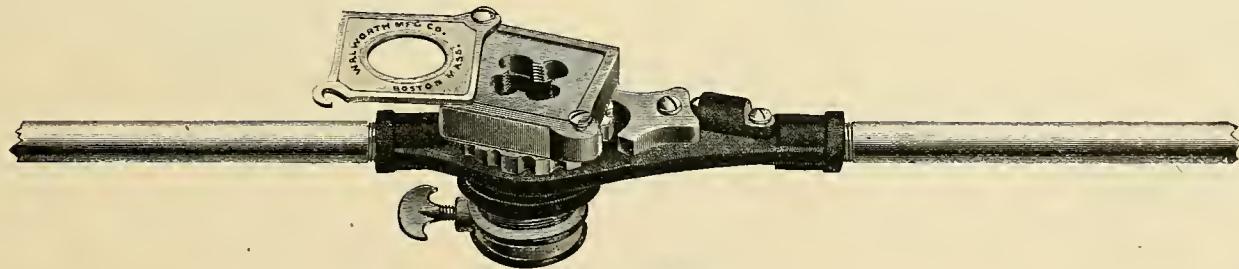


FIG. 569.

No. B—Cuts from

 $\frac{1}{4}$  to 1 inch.

No. C—Cuts from

1 to  $1\frac{1}{2}$  inch.

No. D—Cuts from

 $1\frac{1}{4}$  to 2 inch.

No. E—Cuts from

 $2\frac{1}{2}$  to 3 inch.

## ARMSTRONG'S ADJUSTABLE STOCK AND DIES.

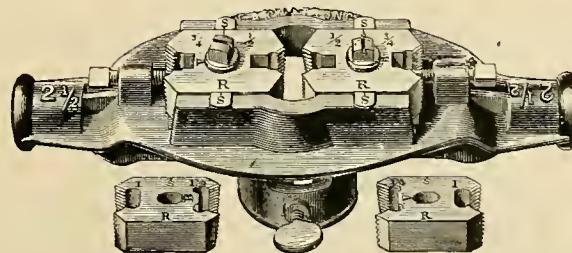


FIG. 570.

No. 1—Cuts from

 $\frac{1}{8}$  to  $\frac{1}{2}$  inch.

No. 2—Cuts from

 $\frac{1}{4}$  to 1 inch.

No. 3—Cuts from

 $1\frac{1}{4}$  to 2 inch.

No. 6—Cuts from

 $2\frac{1}{2}$  to 3 inch.

No. 7—Cuts from

 $2\frac{1}{2}$  to 4 inch.



FIG. 571.

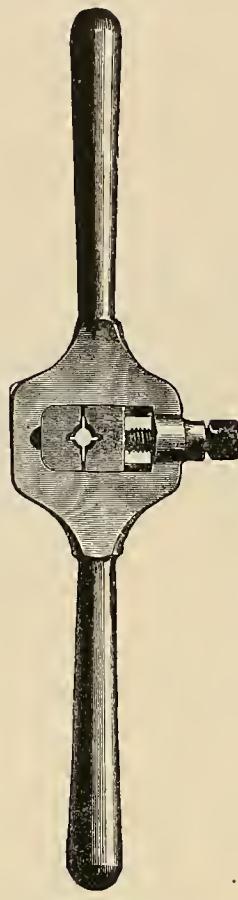
**DEAN STOCK AND DIES**Cuts from  $\frac{1}{8}$  in. to 1 in.

FIG. 572.

**SCREW PLATE AND DIES FOR BOLTS.**

No. A, Cuts from  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in.  
 No. B, Cuts from  $\frac{3}{8}$  in. to  $\frac{3}{4}$  in.  
 No. C, Cuts from  $\frac{1}{2}$  in. to  $\frac{7}{8}$  in.  
 No. D, Cuts from  $\frac{7}{8}$  in. to  $1\frac{1}{4}$  in.



FIG. 574.

**STANWOOD PIPE CUTTER.**

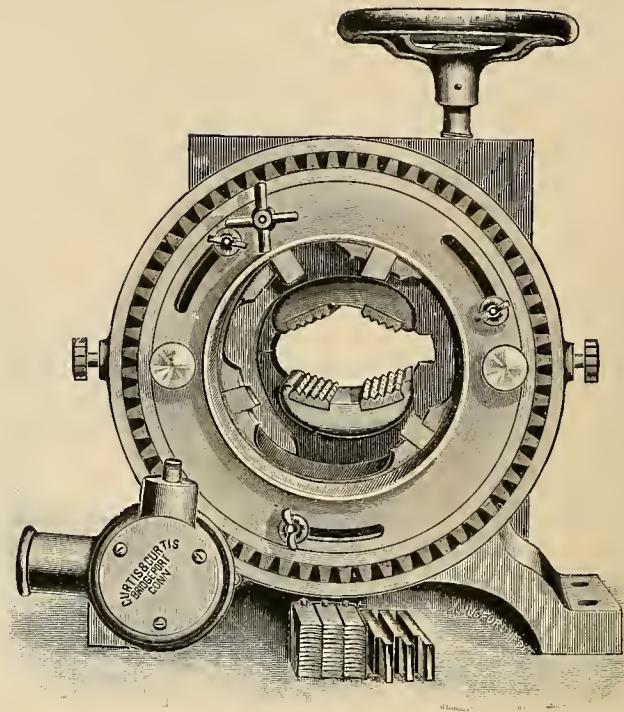
No. 1, Cuts from  $\frac{1}{8}$  in. to 1 in.  
 No. 2, Cuts from  $\frac{3}{4}$  in. to 2 in.  
 No. 3, Cuts from 2 in. to 3 in.



FIG. 576.  
**WHEELS FOR CUTTERS**  
 ALL SIZES.



FIG. 577.  
**PINS FOR CUTTERS.**  
 ALL SIZES.

FIG. 573.  
**FORBE'S PATENT DIE STOCKS.**

No. 1, Cuts from  $\frac{1}{4}$  in. to 2 in.  
 No. 2, Cuts from  $2\frac{1}{2}$  in. to 4 in.  
 No. 3, Cuts from 4 in. to 6 in.

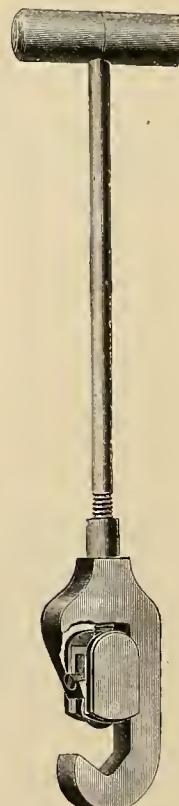


FIG. 575.

**BARNES 3 WHEEL PIPE CUTTER.**

No. 1, Cuts from  $\frac{1}{8}$  in. to 1 in.  
 No. 2, Cuts from  $\frac{1}{2}$  in. to 2 in.  
 No. 3, Cuts from  $1\frac{1}{2}$  in. to 3 in.  
 No. 4, Cuts from  $2\frac{1}{2}$  in. to 4 in.  
 No. 5, Cuts from 4 in. to 6 in.  
 No. 6, Cuts from 6 in. to 8 in.  
 No. 7, Cuts from 9 in. to 12 in.



FIG. 578.  
**COMMON PIPE TONGS.**

From  $\frac{1}{8}$  in. to 8 in. pipe.



FIG. 580.  
**PLYERS.**

From 8 in. to 14 in. long.

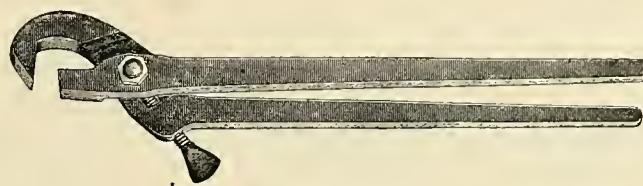


FIG. 579.  
**BROWN'S ADJST. TONGS.**

No. 1, . . . . .	takes from $\frac{1}{8}$ in. to $\frac{3}{4}$ in.
No. 1 $\frac{1}{2}$ , . . . . .	takes from $\frac{3}{8}$ in. to 1 in.
No. 2, . . . . .	takes from $\frac{1}{2}$ in. to $1\frac{1}{4}$ in.
No. 3, . . . . .	takes from 1 in. to 2 in.
No. 4, . . . . .	takes from $1\frac{1}{2}$ in. to 3 in.
No. 5, . . . . .	takes from $2\frac{1}{2}$ in. to 4 in.
No. 6, . . . . .	takes from 3 in. to 5 in.
No. 7, . . . . .	takes from 4 in. to 7 in.



FIG. 581.  
**TRIMO PIPE WRENCH.**

No. 6, takes from  $\frac{1}{8}$  in. wire to  $\frac{1}{2}$  in. pipe.  
No. 8, takes from  $\frac{1}{8}$  in. wire to  $\frac{3}{4}$  in. pipe.  
No. 10, takes from  $\frac{1}{8}$  in. wire to 1 in. pipe.  
No. 14, takes from  $\frac{1}{4}$  in. wire to  $1\frac{1}{2}$  in. pipe.  
No. 18, takes from  $\frac{1}{4}$  in. wire to 2 in. pipe.  
No. 24, takes from  $\frac{1}{4}$  in. wire to  $2\frac{1}{2}$  in. pipe.  
No. 36, takes from  $\frac{1}{2}$  in. wire to  $3\frac{1}{2}$  in. pipe.  
No. 42, takes from 1 in. pipe to 5 in. pipe.

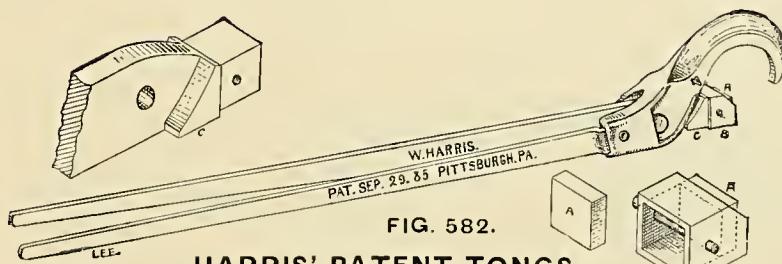


FIG. 582.  
**HARRIS' PATENT TONGS.**

One Tong required for each size of pipe. Steel Handles, Malleable Head, Adjustable Bit, with eight sharp edges.



FIG. 583.  
**ROBBIN'S CHAIN TONGS.**

No. 2, . . . . . takes from 1 in. to 2 in. pipe.  
No. 3, . . . . . takes from  $1\frac{1}{2}$  in. to 4 in. pipe.  
No. 4, . . . . . takes from 2 in. to 6 in. pipe.

No. 5, . . . . . takes from  $2\frac{1}{2}$  in. to 8 in. pipe.  
No. 6, . . . . . takes from 4 in. to 10 in. pipe.  
No. 7, . . . . . takes from 4 in. to 16 in. pipe.



FIG. 584.  
**BROCK'S PAT. CHAIN TONGS.**

No. 0, . . . . . takes from  $\frac{1}{8}$  in. to  $\frac{3}{4}$  in. pipe.  
No. 1, . . . . . takes from  $\frac{1}{8}$  in. to  $1\frac{1}{2}$  in. pipe.  
No. 2, . . . . . takes from  $\frac{1}{4}$  in. to  $2\frac{1}{2}$  in. pipe.

No. 3, . . . . . takes from  $\frac{3}{4}$  in. to 4 in. pipe.  
No. 4, . . . . . takes from 1 in. to 8 in. pipe.  
No. 5, . . . . . takes from 2 in. to 14 in. pipe.

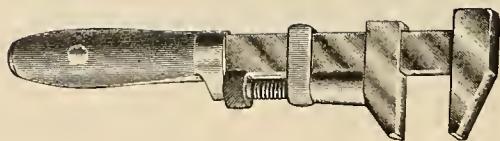


FIG. 585.  
**MONKEY WRENCH.**  
FROM 6 IN. TO 21 IN. LONG.

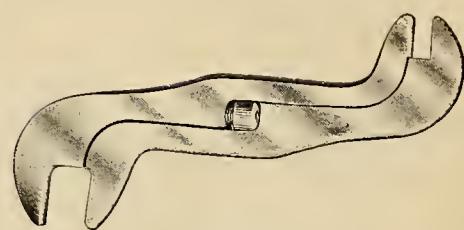


FIG. 586.  
**BAXTER'S WRENCH.**  
FROM 4 IN. TO 15 IN. LONG.

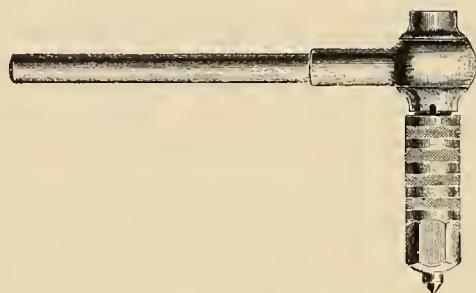


FIG. 587.  
**SMITH'S FRICTION SLEEVE RATCHET.**  
FROM 10 IN. TO 20 IN. LONG.

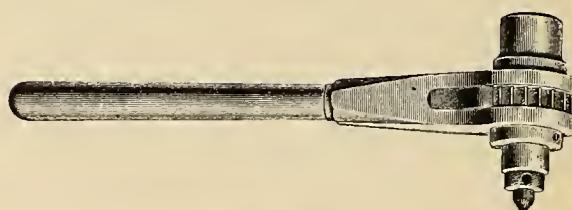


FIG. 588.  
**PACKER BOILER RATCHET.**  
FROM 10 IN. TO 20 IN. LONG.



FIG. 589.  
**PIPE TAP.**



FIG. 590.  
**PIPE REAMER.**



FIG. 591.  
**COMBINED  
TAP, REAMER  
AND DRILL.**



FIG. 592.  
**PIPE DRILL.**



FIG. 593.



FIG. 594.  
**TWIST DRILL. COUNTERBORE  
DRILL.**



FIG. 595.  
**TAPER.**



FIG. 596.  
**PLUG.**



FIG. 597.  
**BOTTOMING.**

MACHINISTS' TAPS.

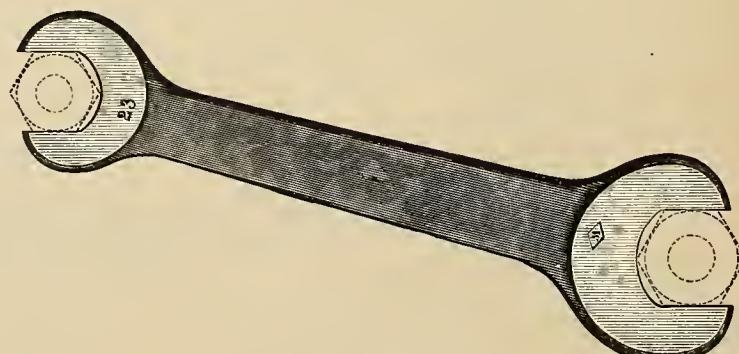


FIG. 598.  
**WRENCH, DROP FORGED.**  
(ALL SIZES AND STYLES.)

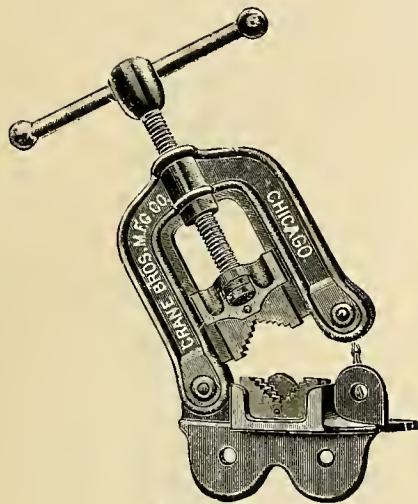


FIG. 599.  
PIPE VISE.  
MALLEABLE.

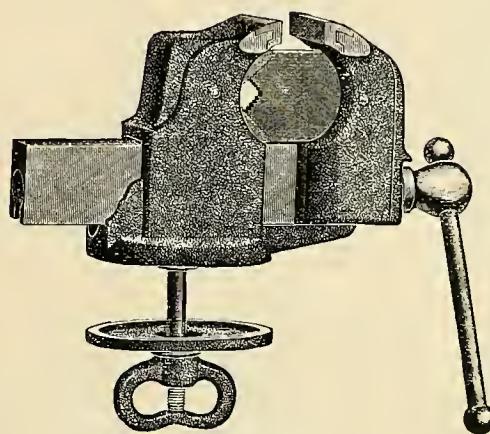


FIG. 600.  
COMBINATION VISE.  
SMITH'S.



FIG. 601.  
HAMMERS AND SLEDGES.  
MACHINISTS.

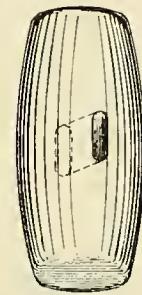


FIG. 602.  
COPPER.



FIG. 603.  
GLASS TUBE CUTTER.



FIG. 604.  
COPPER FLOATS.  
HEAVY FOR BOILER PRESSURE.  
LIGHT FOR TANK PRESSURE.

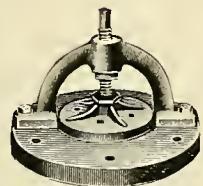


FIG. 604 1/2.  
TANK VALVES.

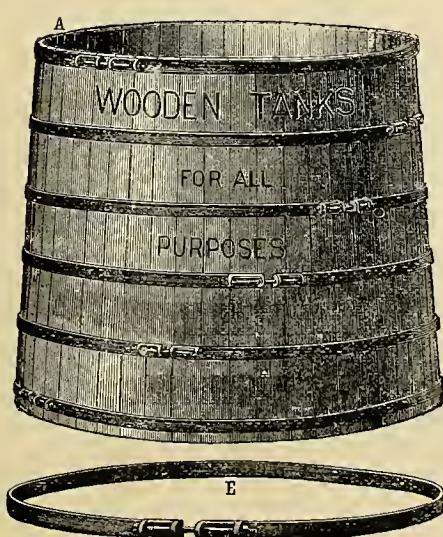


FIG. 605.  
WOODEN TANKS.  
ANY CAPACITY.

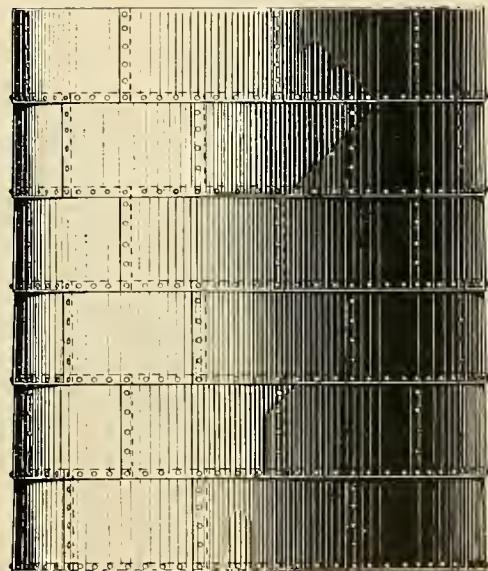


FIG. 606.  
IRON TANKS.  
ANY CAPACITY.

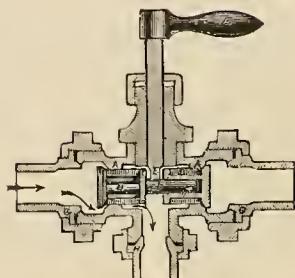


FIG. 607.

LUNKENHEIMER'S  
AUTOMATIC CYLINDER  
COCK.

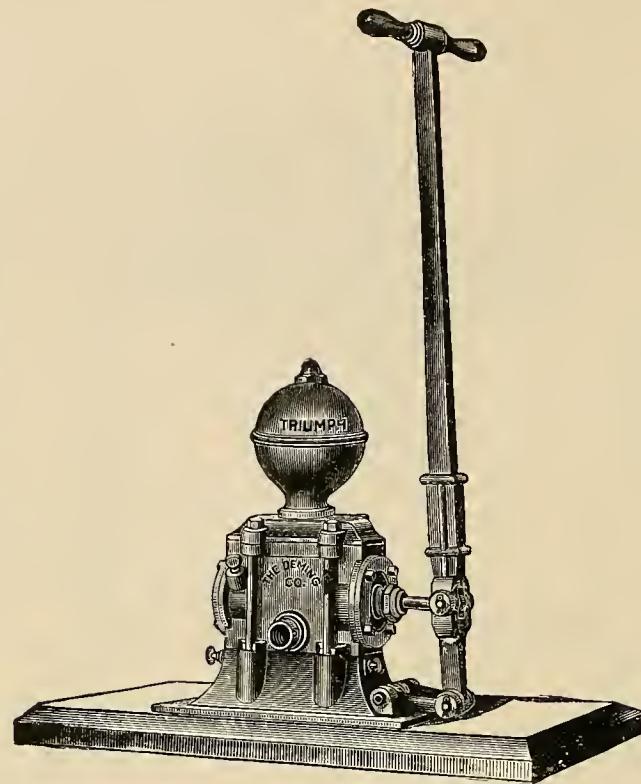


FIG. 608.

TRIUMPH DOUBLE ACTING FORCE PUMP.

SINGLE LEVER.

ALSO MADE WITH DOUBLE LEVER.



FIG. 610.

CLIMAX OIL BURNER.

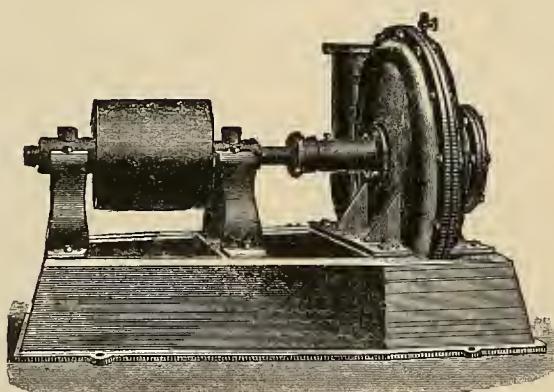


FIG. 611.

HORIZONTAL CENTRIFUGAL PUMP.

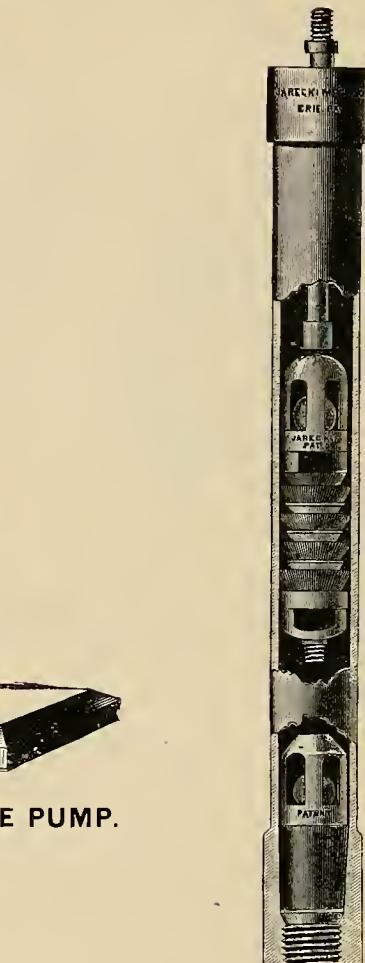


FIG. 609.

WORKING BARREL.

FOR DEEP WELLS.

From 2 in. to 6 in. in diameter.

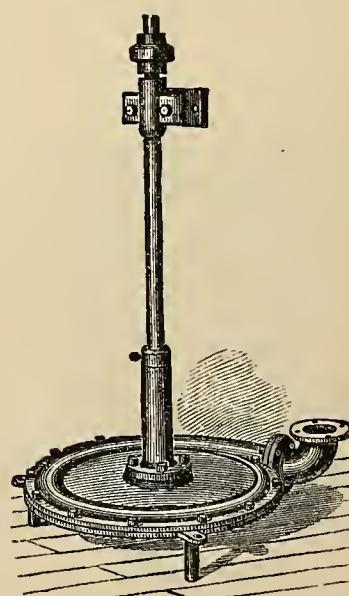


FIG. 612.

VERTICAL CENTRIFUGAL  
PUMP.

Descriptive circular on application.

## BUFFALO DUPLEX STEAM PUMPS.

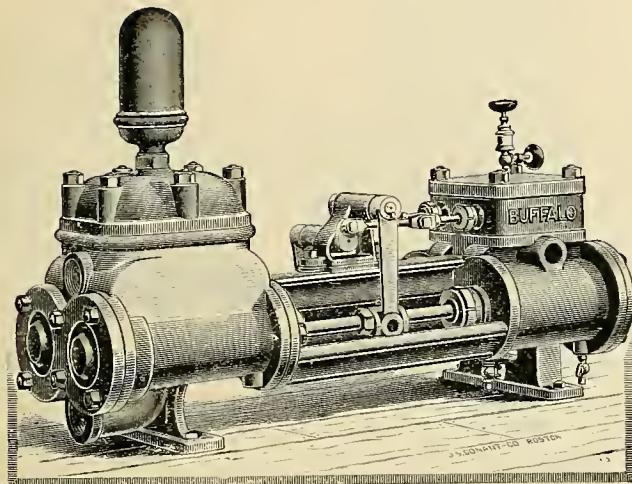


FIG. 613.  
BOILER FEED PUMP.  
REGULAR PATTERN.

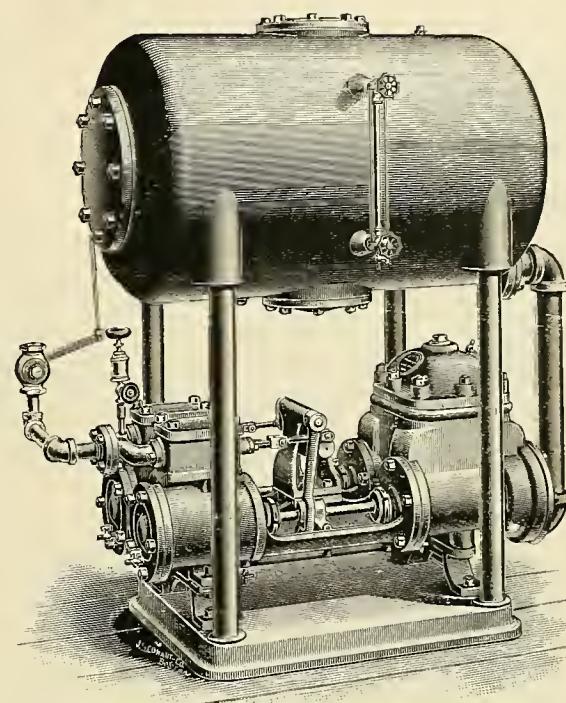


FIG. 614.  
AUTOMATIC FEED PUMP  
WITH RECEIVING TANK.

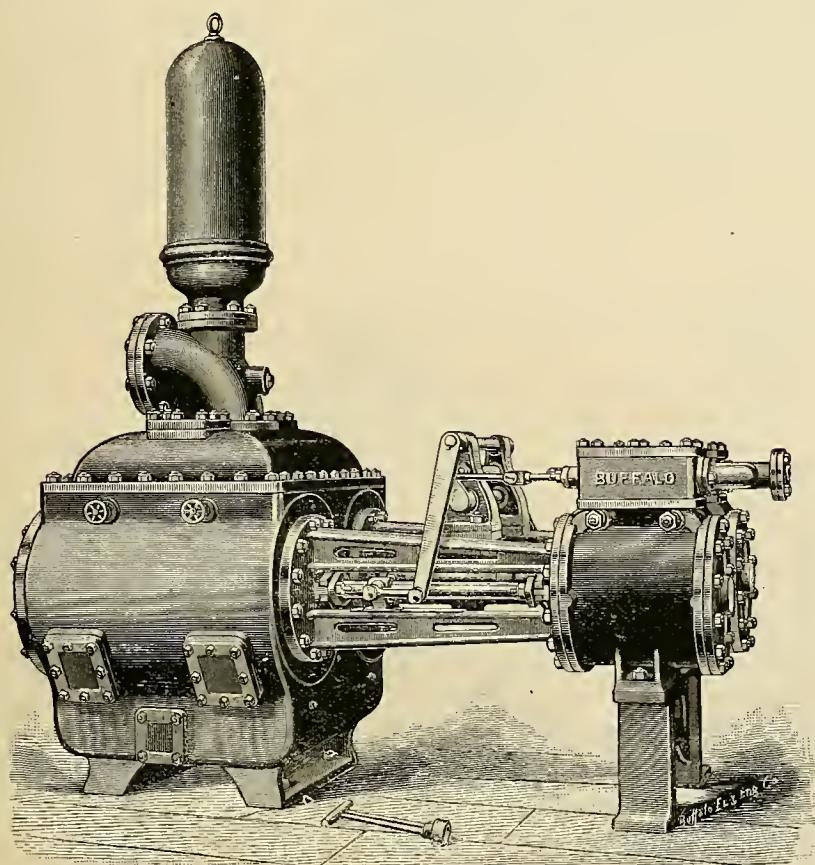
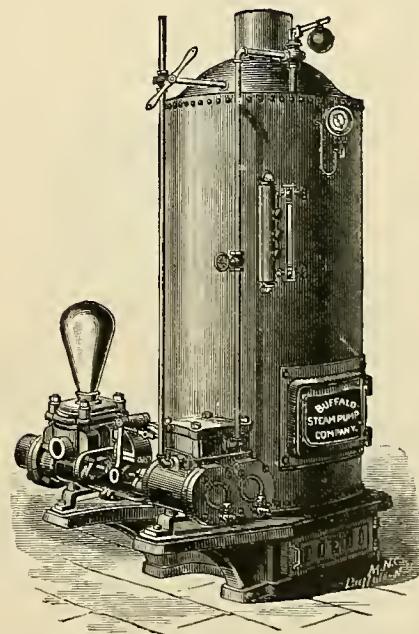


FIG. 615.  
LOW SERVICE OR TANK PUMP.



616.  
PUMP AND BOILER  
COMBINED.

Pump Catalogue on Application.

## BUFFALO STEAM PUMPS.

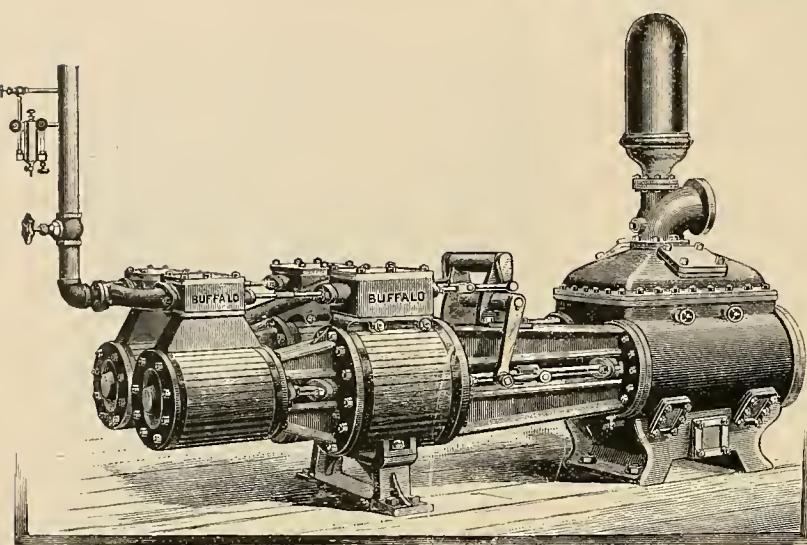


FIG. 617.  
COMPOUND DUPLEX PUMP.  
NON-CONDENSING.

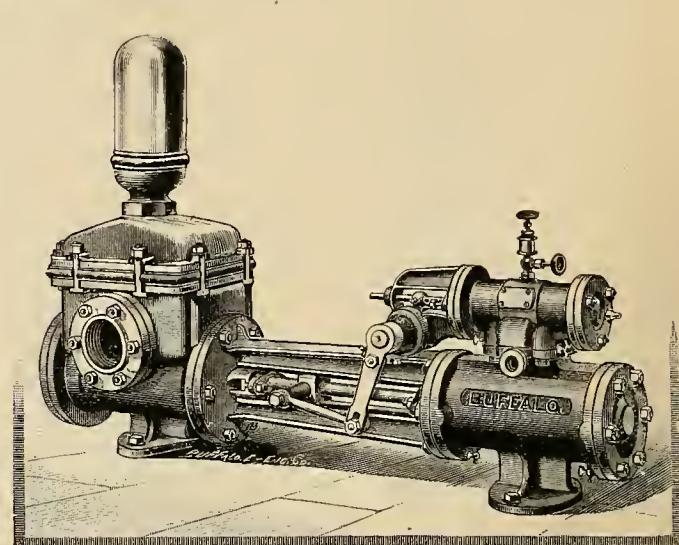


FIG. 619.  
IMPROVED SINGLE CYLINDER PUMP.

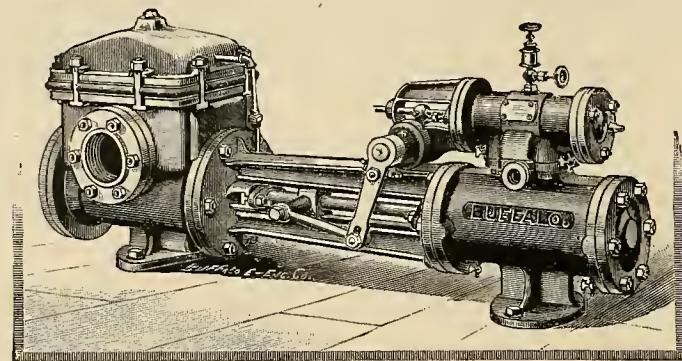


FIG. 620.  
IMPROVED SINGLE CYLINDER.  
VACUUM PUMP.

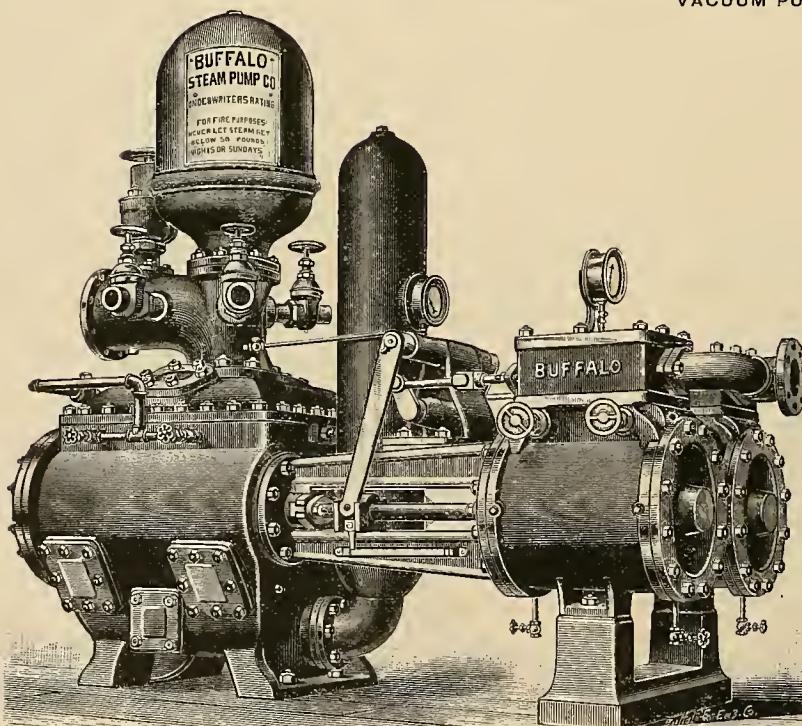


FIG. 618.  
UNDERWRITERS' FIRE PUMP.

Pump Catalogue on Application.

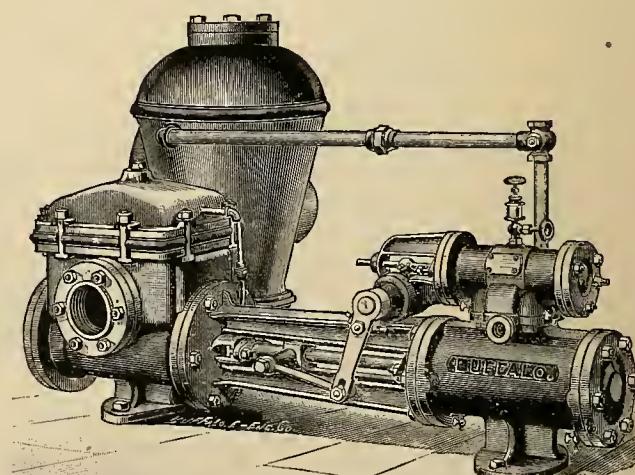


FIG. 621.  
IMPROVED SINGLE CYLINDER.  
INDEPENDENT AIR PUMP AND JET CONDENSER.

BUFFALO DUPLEX STEAM PUMPS.

DUPLEX PUMP

WITH

EXTERNAL

CENTRE PACKED

PLUNGERS.

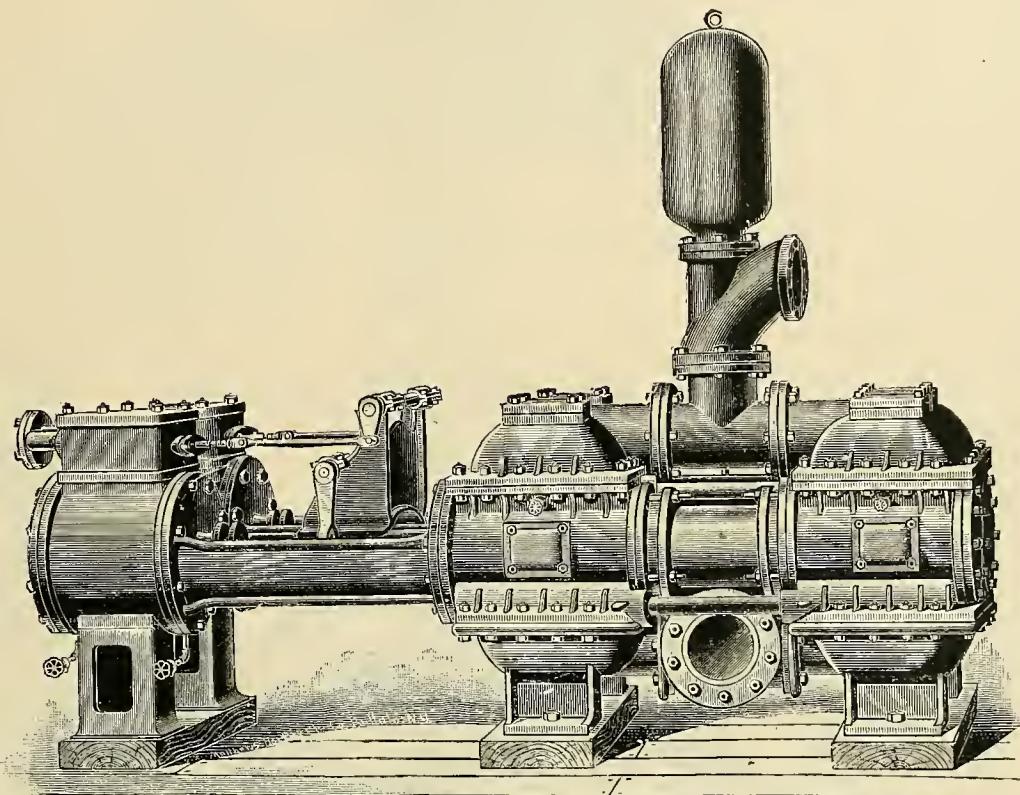


FIG. 622.

DUPLEX PUMP

WITH

EXTERNAL PACKED

PLUNGERS.

OUTSIDE

CONNECTED.

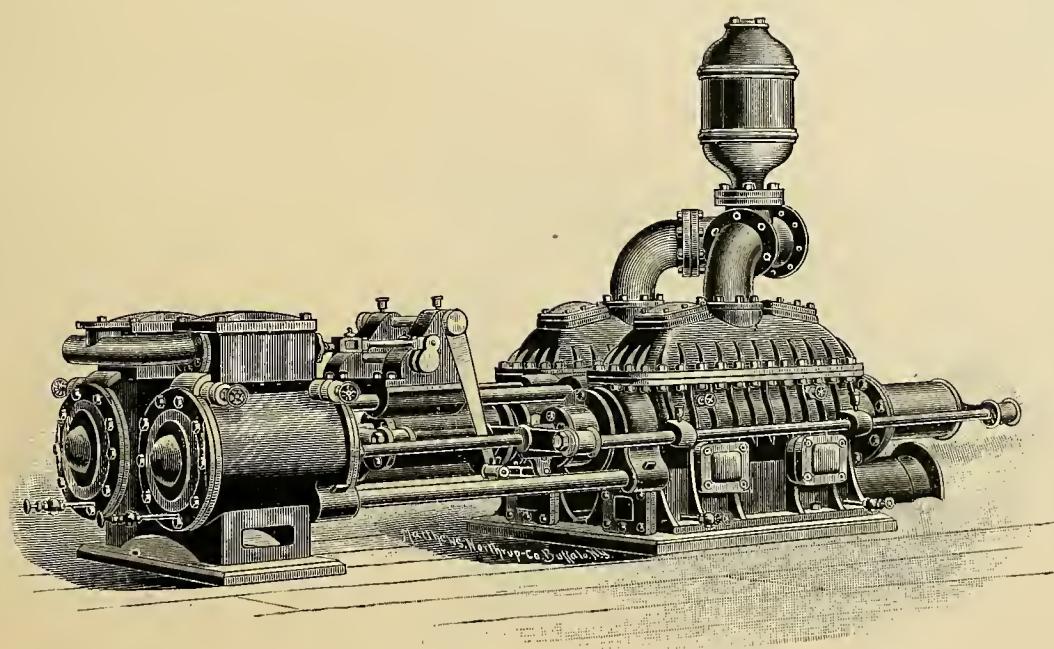


FIG. 623.

Pump Catalogue on Application.

## BUFFALO STEAM PUMPS.

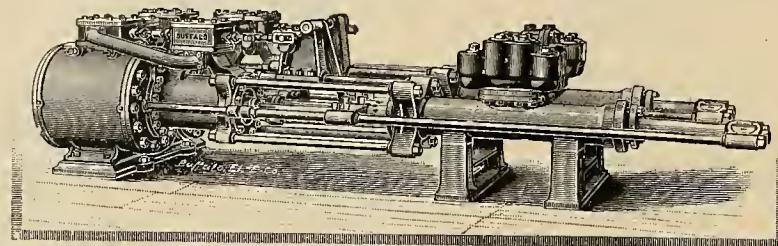


FIG. 624.

## COMPOUND DUPLEX HYDRAULIC PRESSURE PUMP.

## BUFFALO DUPLEX POWER PUMP.

STYLE "B."

WITH INDEPENDENT WATER CYLINDERS.

Size, 6-Inch Piston, 10-inch Stroke.

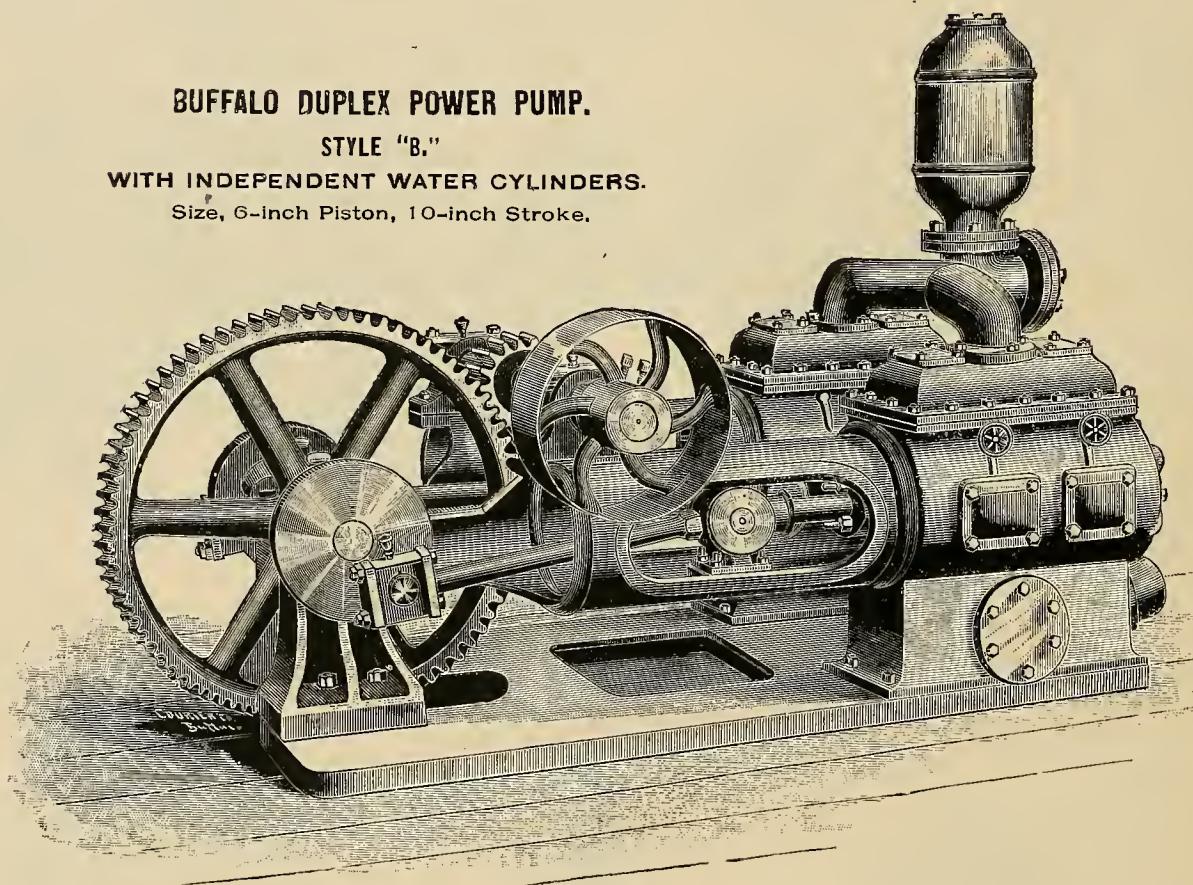
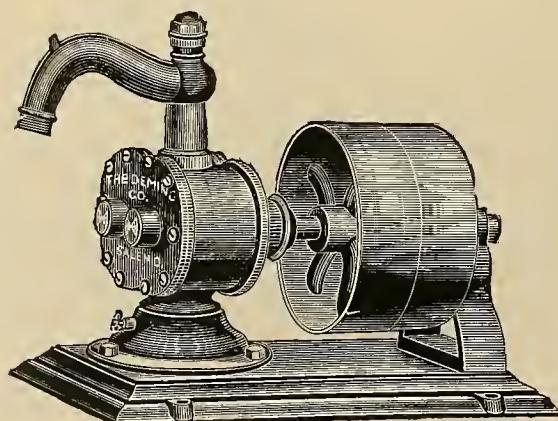


FIG. 625.

FIG. 626.  
ROTARY FORCE PUMP.

Pump Catalogue on Application.

SNOW DUPLEX STEAM PUMPS.

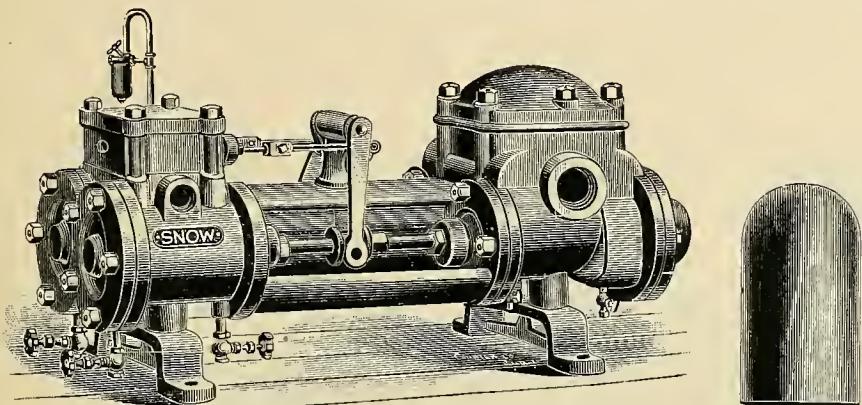


FIG. 627.  
BOILER FEED PUMP.

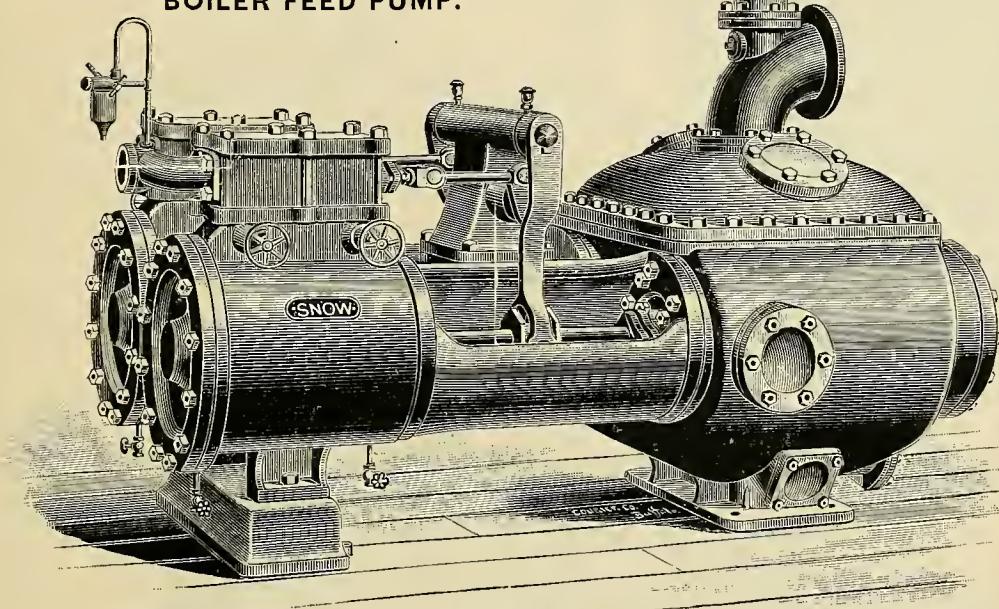


FIG. 628.  
PLUNGER PUMP.

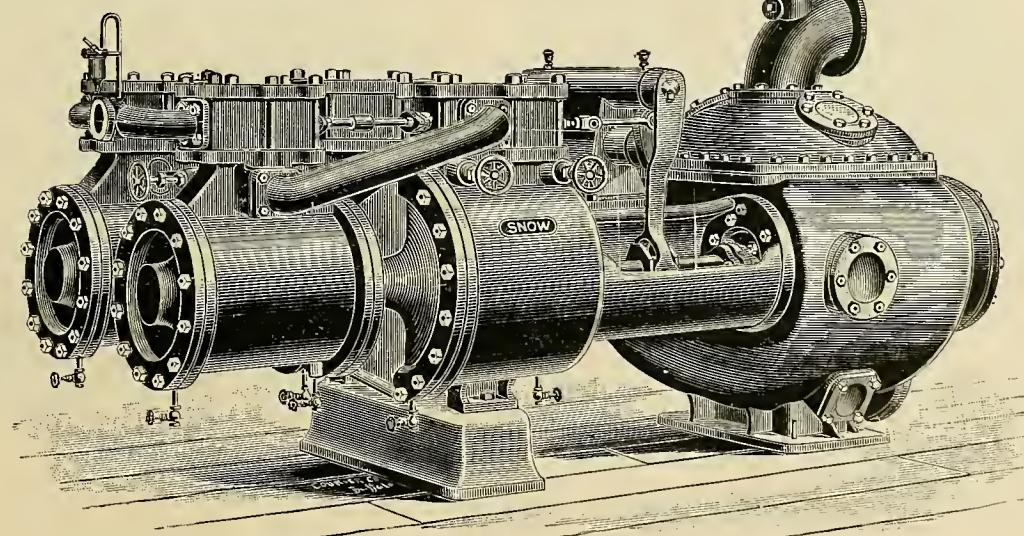


FIG. 629.  
COMPOUND PUMP.

Pump Catalogue on Application.

## SNOW DUPLEX STEAM PUMPS.

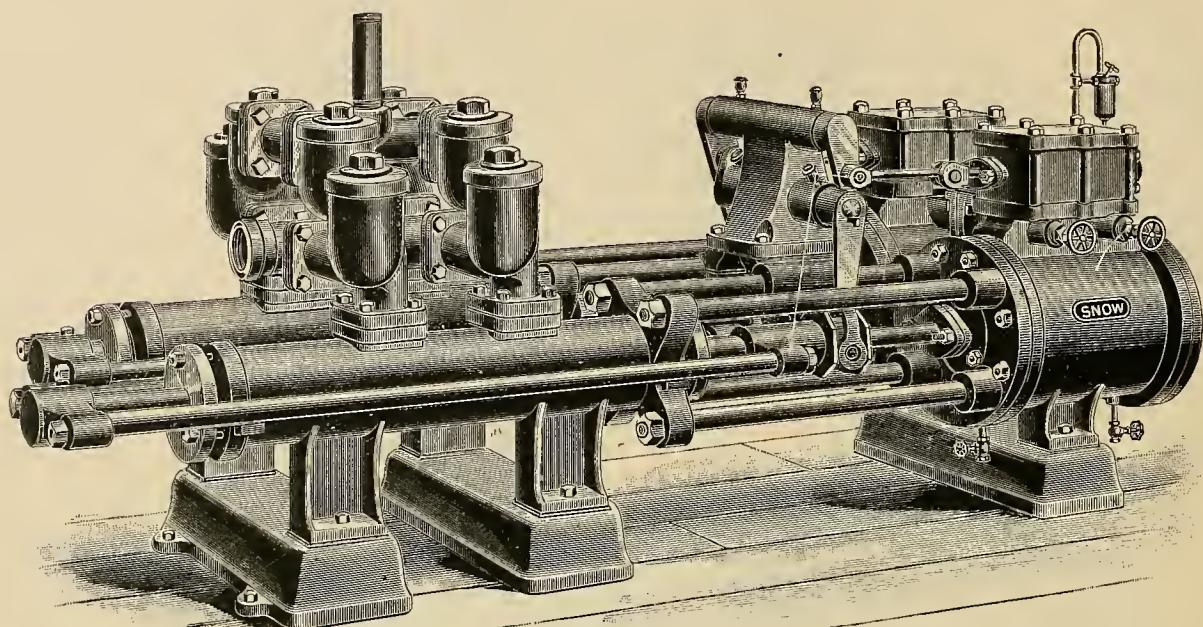


FIG. 630.  
HYDRAULIC PRESSURE PUMP.

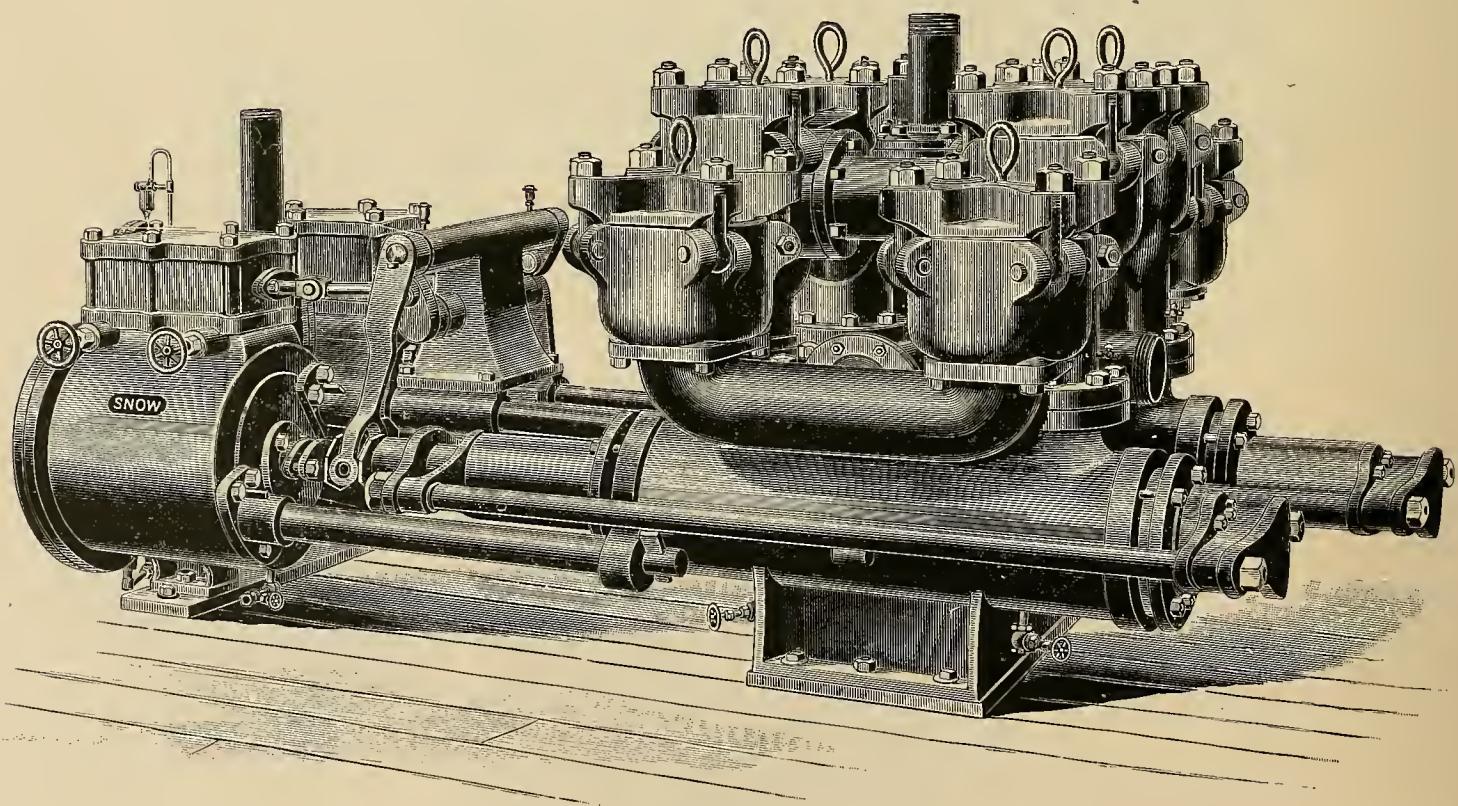


FIG. 631.  
MINE PUMP—HIGH PRESSURE.

Pump Catalogue on Application.

**HORIZONTAL OR VERTICAL CYLINDERS (60 inch Diameter or less) REBORED**

In their permanent position anywhere in the U. S.

ALSO

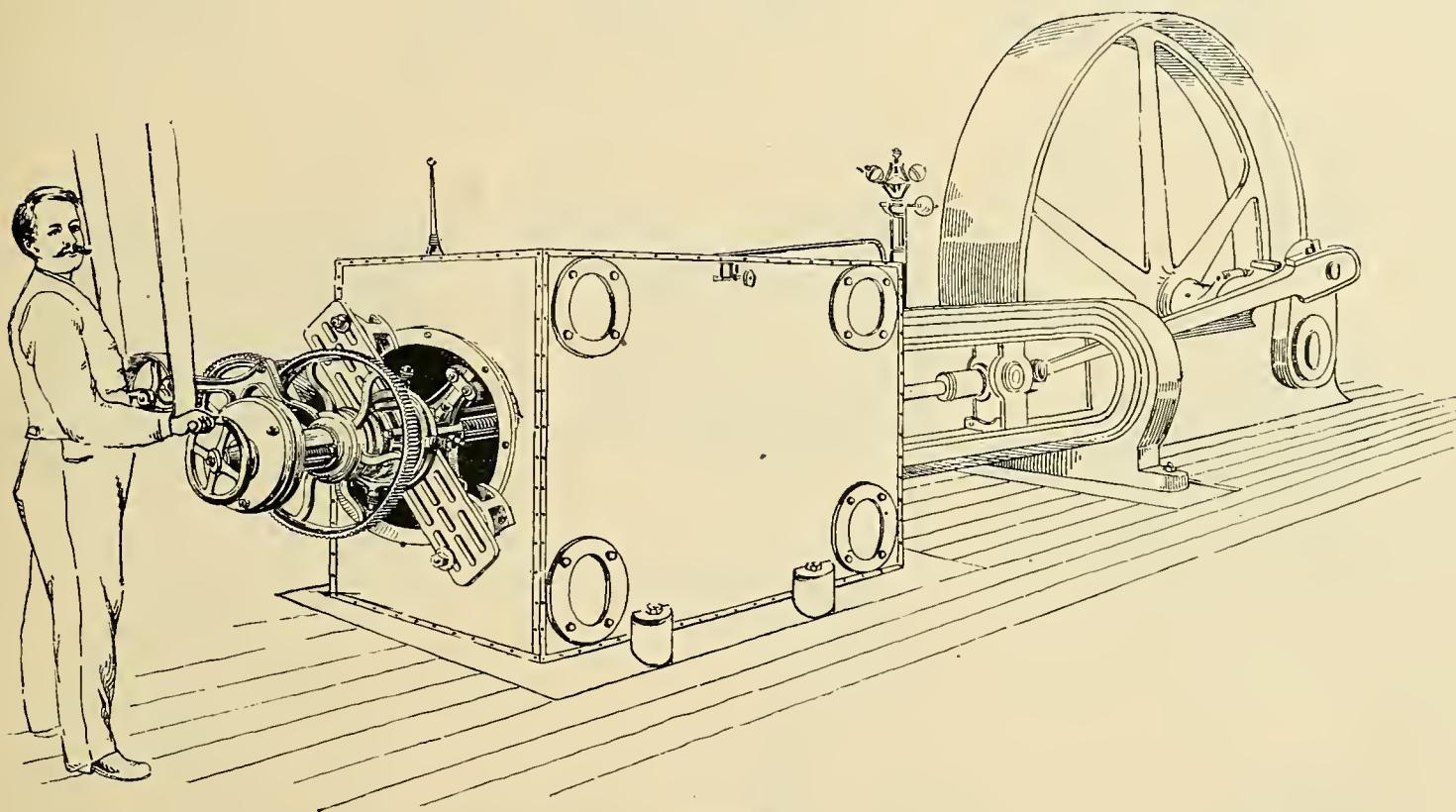
**CORLISS VALVES, LARGE BEARINGS, GEAR AND FLY WHEELS.**

FIG. 632

WE MAKE

**PISTON HEADS (Steel or Iron) 60 INCHES DIAM. or less.**

**PACKING RINGS of CLIMAX BRONZE, BABBITT, Steel or Iron.**

**PISTON RODS of COLD ROLLED STEEL or PHOSPHOR BRONZE.**

**STEEL SHAFTS, CRANKS, PITMANS, KEYS, Etc.**

**CLIMAX BRONZE BEARINGS AND SLIDES.**

**PITMAN & STRAP BRASSES, Etc., Etc.**

**REPAIRS**

**FOR ALL STYLES AND SIZES OF ENGINES.**

**PUMPS AND SPECIAL MACHINERY AT SHORT NOTICE.**

Estimates furnished on Application.

## HOSE, PACKING, ETC.

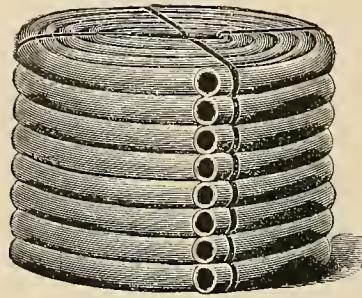


FIG. 633.  
RUBBER HOSE.  
FROM  $\frac{1}{2}$  IN. TO 4 IN. AND  
FROM 2 TO 6 PLY.



FIG. 634.  
STEEL WIRE WRAPPED HOSE. RUBBER SUCTION HOSE



FIG. 635.



FIG. 636.  
SHEET PACKING.  
FROM 1-64 TO  $\frac{1}{4}$  IN. THICK.

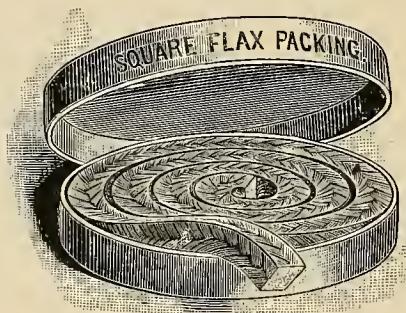


FIG. 637.  
FLAX PACKING.



FIG. 638.  
JENKINS' PACKING.

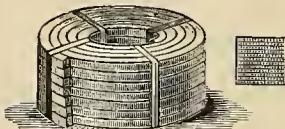


FIG. 639.  
SQUARE  
PISTON PACKING.

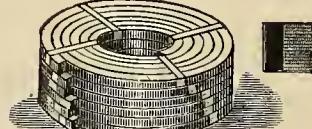


FIG. 640.  
RUBBER BACK  
PISTON PACKING.



FIG. 641.  
GARLOCK'S  
ELASTIC PACKING.



FIG. 642.  
USUDURIAN PACKING.  
SELF-VULCANIZING.

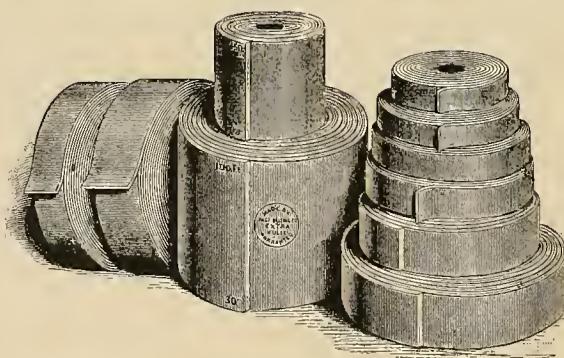


FIG. 643.  
RUBBER BELTING.  
FROM 1 IN. TO 52 IN. WIDE,  
FROM 2 TO 8 PLY.

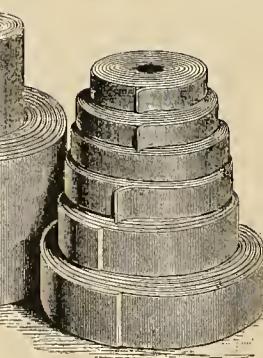


FIG. 643.  
LEATHER BELTING.  
FROM 1 IN. TO 48 IN. WIDE.

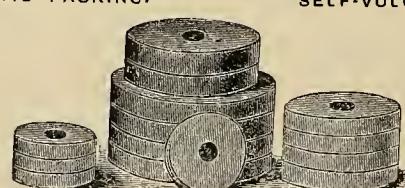


FIG. 644.  
PUMP VALVES.  
HARD AND SOFT RUBBER OR BRASS.



FIG. 645.  
STRAIGHT.

BRASS PUMP.  
SPRINGS.



FIG. 646.  
CONICAL.

Special Packings Furnished.

## SECTIONAL COVERINGS FOR STEAM PIPES.

## MAGNESIA COVERING.

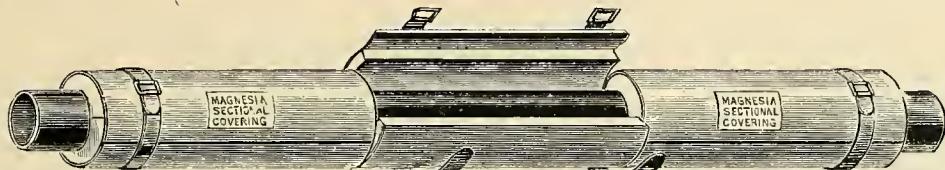


FIG. 647.



FIG. 648.



FIG. 649.



FIG. 650.

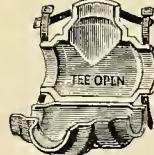


FIG. 651.

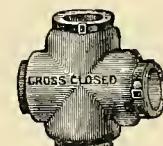


FIG. 652.

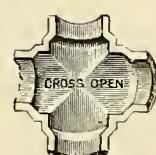


FIG. 653.

## MAGNESIA OR MAGNABESTOS COVERING FOR FITTINGS.

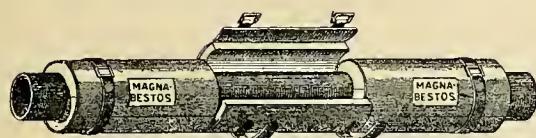


FIG. 654.

## MAGNABESTOS COVERING.

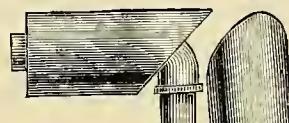


FIG. 655.

## MAGNESIA OR MAGNABESTOS.

SECTIONAL BLOCKS AND PLASTIC COVERING.

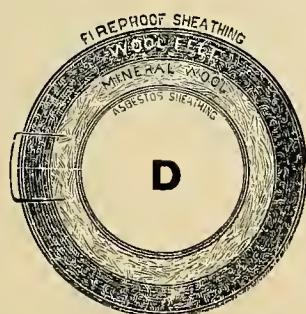
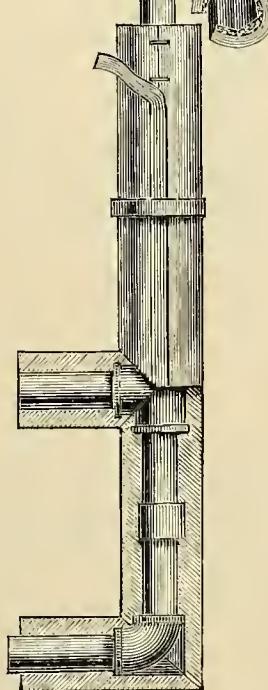


FIG. 656.



## ABESTOS SECTIONAL COVERING.

ATTACHED TO PIPE.

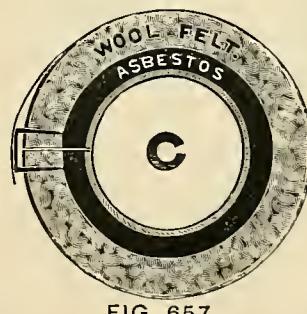


FIG. 657.

Mineral Wool, Hair Felt, &amp;c., Furnished as Desired.

## CLIMAX BRONZE AND BRASS CASTINGS

From 1-2 oz. to 12,000 lbs. Weight.

ROUGH OR FINISHED.

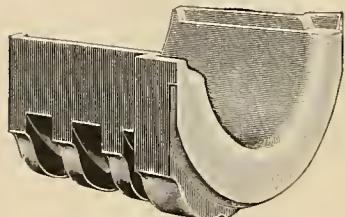


FIG. 659.

ROLL AND ENGINE BEARINGS.

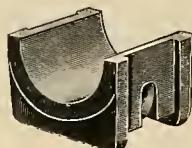


FIG. 660.

STRAP BRASSES.

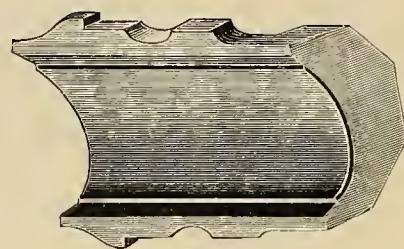


FIG. 661.

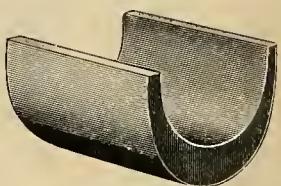
CAR BEARINGS.  
WITH OR WITHOUT LEAD LINING.

FIG. 662.

LOCOMOTIVE  
DRIVING  
BOX BRASSES.

FIG. 663.

STEP BEARINGS.

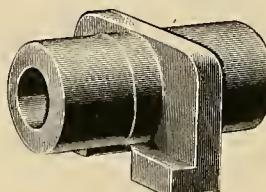


FIG. 664.

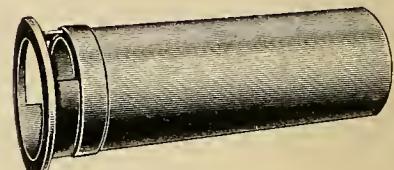
BUSHINGS  
FOR BLOOMING MILL TABLES.

FIG. 665.

PUMP LININGS.  
-OR BUSHINGS.

PINIONS.

FOR ELECTRIC CARS.

BEARINGS.

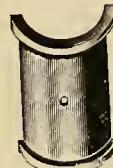
FIG. 667.  
PLAIN.FIG. 668.  
BEVEL.FIG. 669.  
PLAIN.FIG. 670.  
WITH COLLAR.FIG. 666.  
BRONZE PISTON RODS.  
ANY DIAMETER OR LENGTH,  
WITH OR WITHOUT STEEL CENTRES.

FIG. 671.

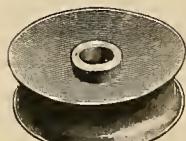
TROLLEY  
SWITCHES.

FIG. 672.

TROLLEY  
WHEELS.

FIG. 673.

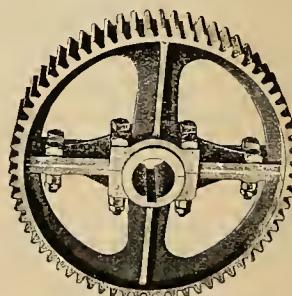
ONE PIECE GEAR WHEEL.  
IRON AND STEEL.

FIG. 674.

SPLIT GEAR WHEEL.  
IRON AND STEEL.

## CLIMAX BRONZE AND BRASS CASTINGS.

ROUGH OR FINISHED.

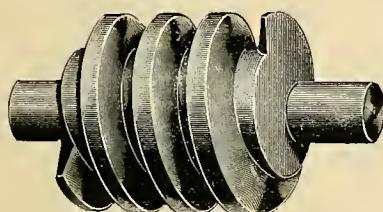


FIG. 675.  
WORM-WHEEL  
CLIMAX BRONZE GRADE.

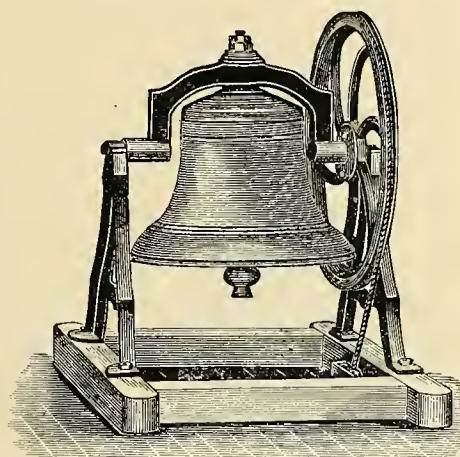


FIG. 676.  
BELLS OF ANY SIZE AND TONE.

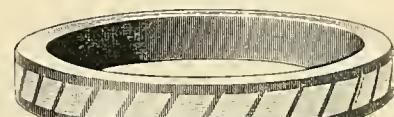


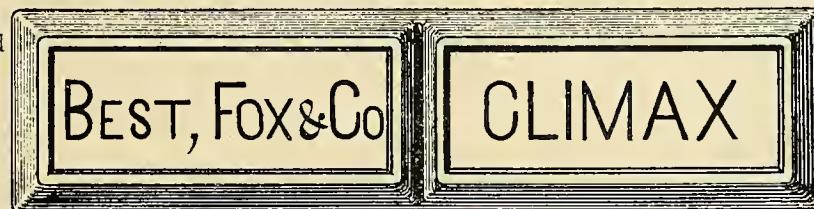
FIG. 677.  
PACKING RINGS  
OF ANY SIZE.  
PLAIN OR BABBITED.

Grade XX Phosphorized

Grade XX

" X

" A



Grade B

" C

" D

" E

FIG. 578.

## CLIMAX BABBITT METAL.

ALL GRADES.



FIG. 679.  
INGOT  
CLIMAX BRONZE.  
INGOT BRASS.  
ALL GRADES.



FIG. 681.  
PHOSPHOR TIN.



FIG. 683.  
SHEET LEAD.  
ANY THICKNESS.



FIG. 685.  
ROUND COPPER ROD.  
" BRASS "  
ALL SIZES.

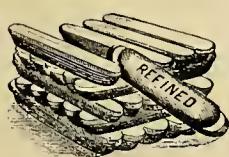


FIG. 680.  
PIG LEAD.

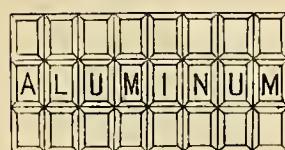


FIG. 682.  
ALUMINUM.

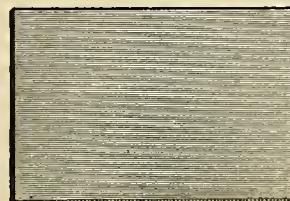


FIG. 684.  
SHEET COPPER.  
" BRASS.  
ANY THICKNESS.



FIG. 686.  
SQUARE COPPER ROD  
" BRASS "  
ALL SIZES.

## BLAST FURNACE SPECIALTIES. CLIMAX BRONZE TUYERES.

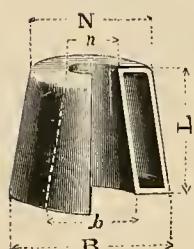
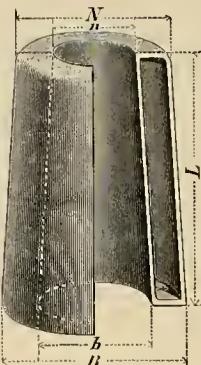
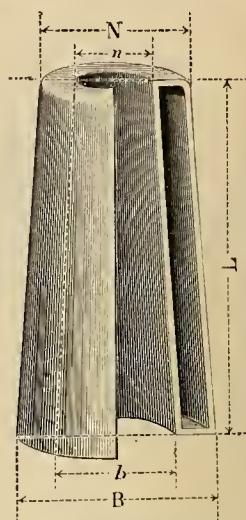
(800 PATTERNS TO SELECT FROM)

SHORT—Less than 12 in. long.

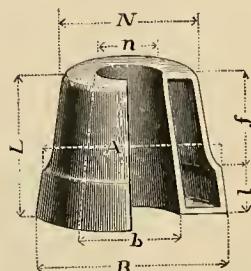
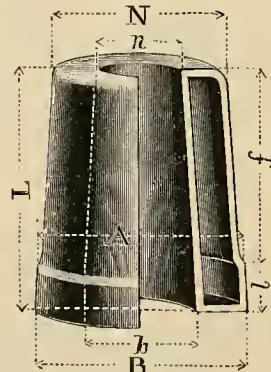
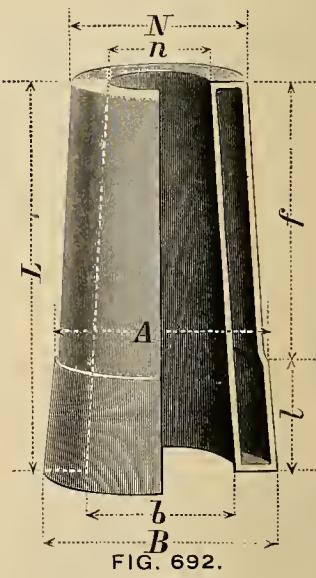
MEDIUM—Between 12 and 16 in. long.

LONG—Over 16 in. long.

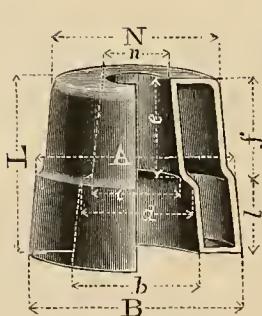
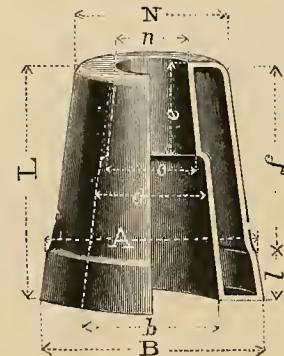
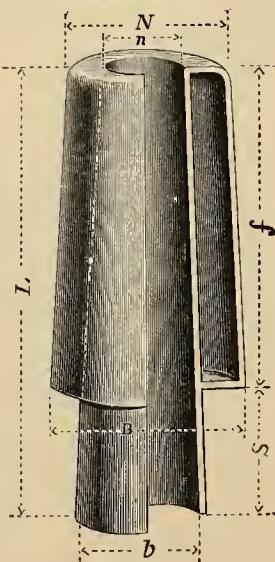
## CLASS A.

FIG. 687.  
SHORT.FIG. 688.  
MEDIUM.FIG. 689.  
LONG.

## CLASS B.

FIG. 690.  
SHORT.FIG. 691.  
MEDIUM.FIG. 692.  
LONG.

## CLASS D.

FIG. 693.  
SHORT.FIG. 694.  
MEDIUM.FIG. 695.  
LONG.

## CLASS E.

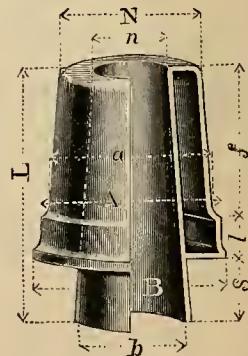


FIG. 696.

See Catalogue F for Dimensions of Above.

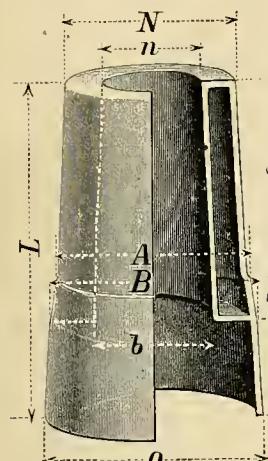
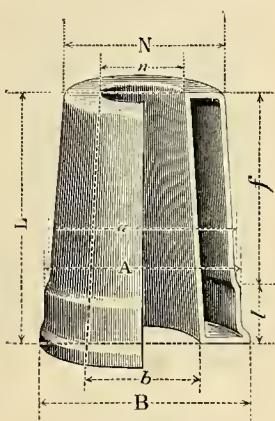
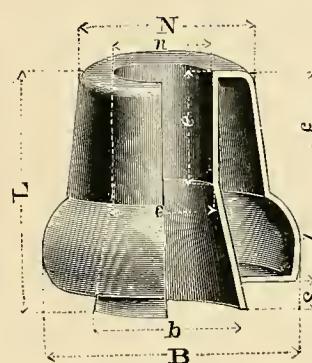
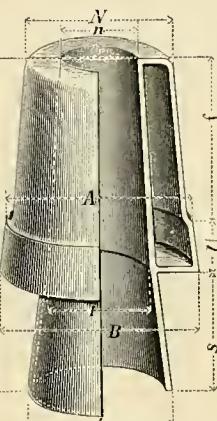
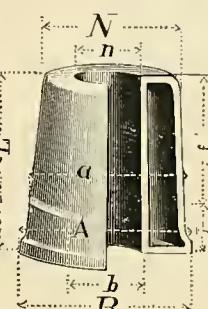
## CLIMAX BRONZE TUYERES, NOTCHES AND COOLERS.

(800 PATTERNS TO SELECT FROM.)

SHORT—Less than 12 in. long.

MEDIUM—Between 12 and 16 in. long.

LONG—Over 16 in. long.

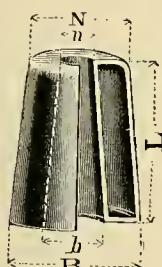
FIG. 697.  
**CLASS F.**  
LONG.FIG. 698.  
**CLASS G.**  
MEDIUM.FIG. 699.  
**CLASS H.**FIG. 700.  
**CLASS I.**FIG. 701.  
**CLASS J.**

## NOTCHES.

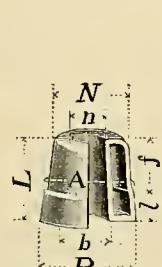
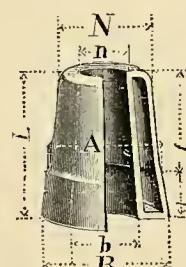
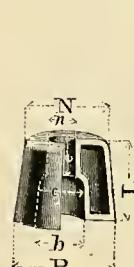
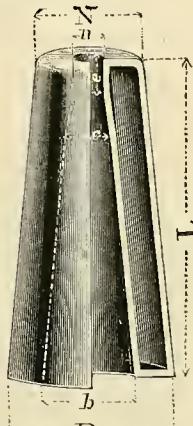
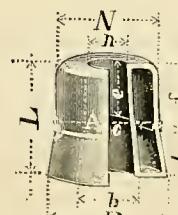
SHORT—Less than 10 in. long.

MEDIUM—Between 10 and 15 in.

LONG—Over 15 in. long.

FIG. 702.  
**CLASS A.**  
SHORT.

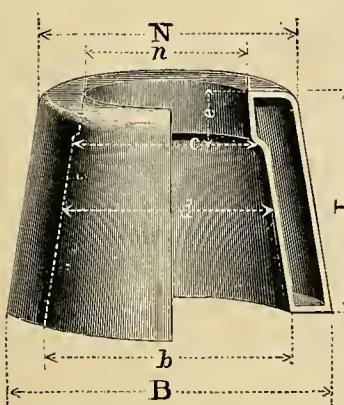
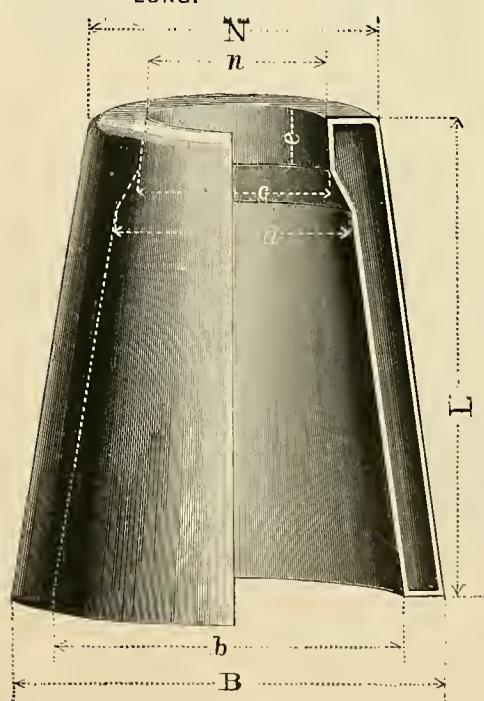
LONG.

FIG. 704.  
SHORT.FIG. 705.  
MEDIUM.FIG. 706.  
SHORT.FIG. 707.  
LONG.FIG. 708.  
**CLASS D.**

## COOLERS.

SHORT—Less than 22 in. long.

LONG—Over 22 in. long.

FIG. 709.  
SHORT.**COOLERS. CLASS A.**FIG. 710.  
LONG.

See Catalogue F for Dimensions of Above.

## CLIMAX BRONZE COOLERS, NOTCH COOLERS, ETC.

SHORT—Less than 22 in. long.

LONG—Over 22 in. long.

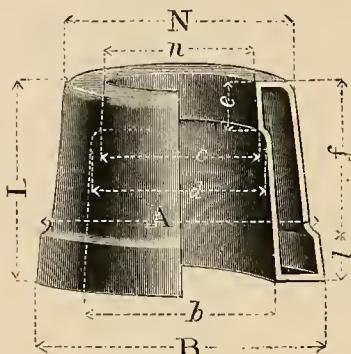


FIG. 711.  
**CLASS B.**  
SHORT.

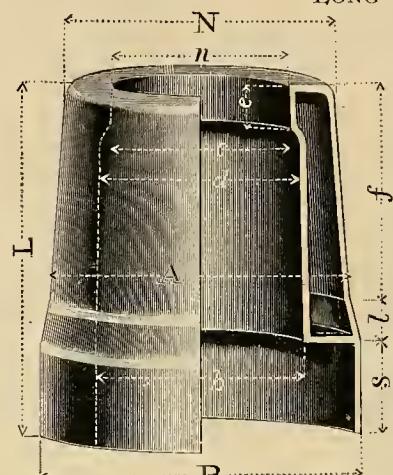


FIG. 712.  
**CLASS F.**  
LONG.

## NOTCH COOLERS.

SHORT—Less than 12 in. long.

MEDIUM—Between 12 and 16 in. long

LONG—Over 16 in. long.

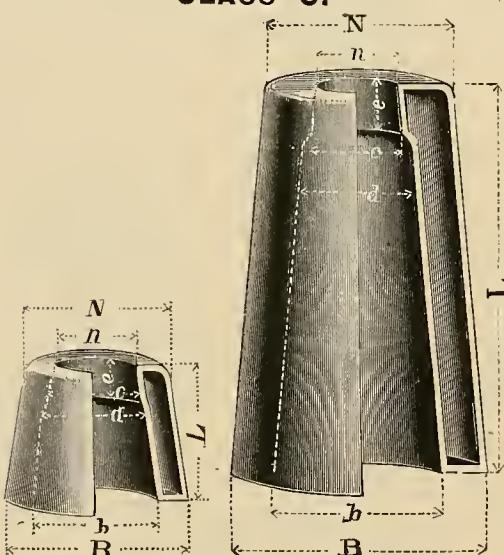
**CLASS C.**

FIG. 713.  
SHORT.

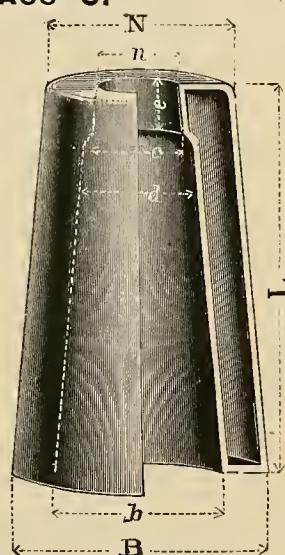


FIG. 714.  
LONG.

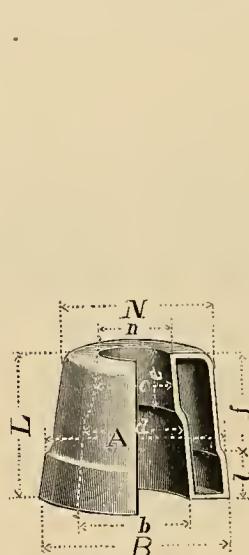


FIG. 715.  
SHORT.

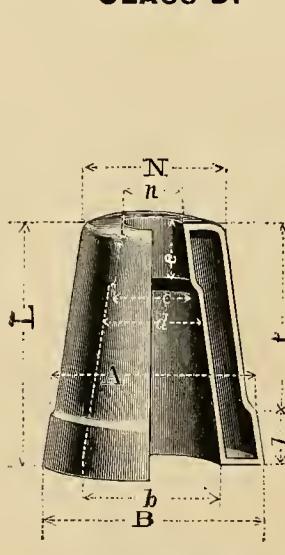


FIG. 716.  
MEDIUM.

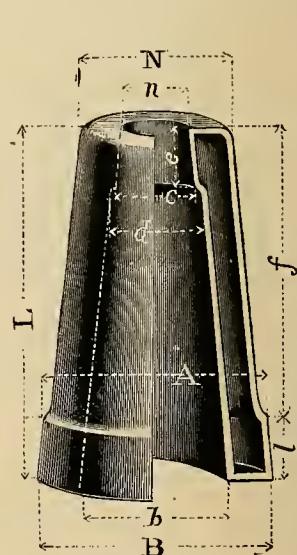


FIG. 717.  
LONG.

## BOSH BOXES. (FRONHEISER'S PATENT.)

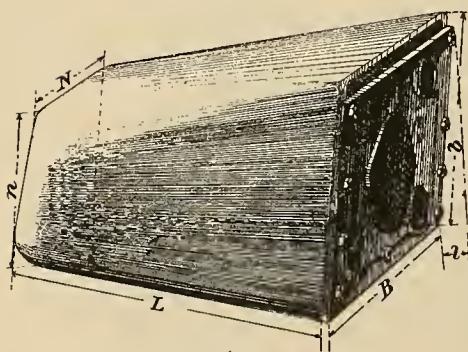


FIG. 718.  
**CLASS A.**

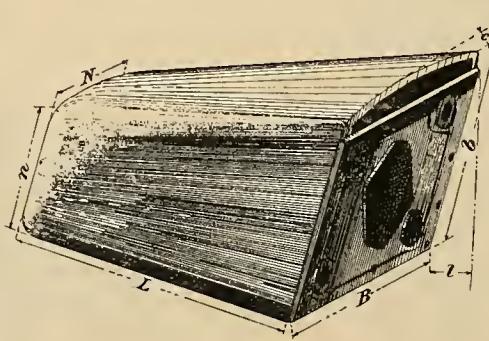


FIG. 719.  
**CLASS B.**

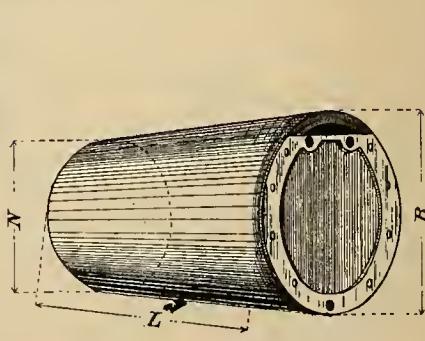


FIG. 720.  
**CLASS C.**

See Catalogue F for Dimensions of Above.

## CLIMAX BRONZE BOSH PLATES, JACKETS, ETC.

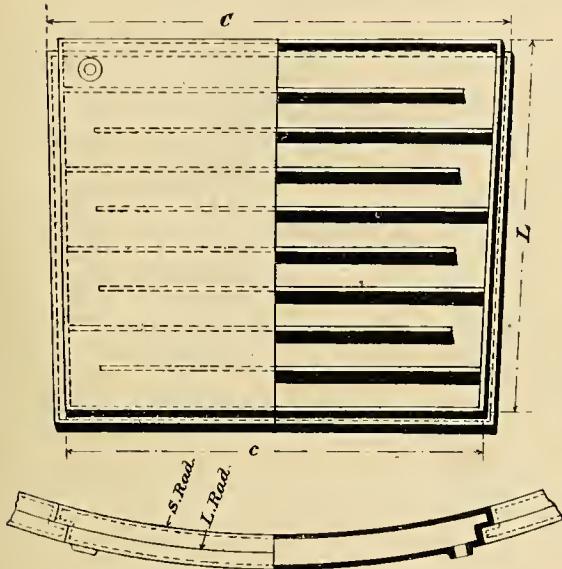


FIG. 721.  
HUNT'S PATENT BOSH JACKET.

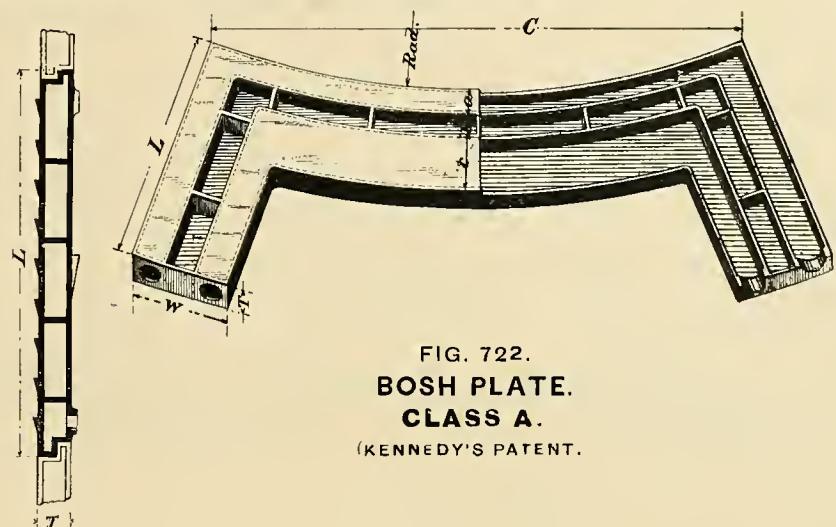


FIG. 722.  
BOSH PLATE.  
CLASS A.  
(KENNEDY'S PATENT.)

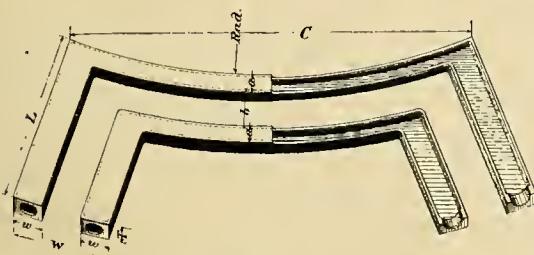


FIG. 723.  
BOSH PLATE.  
CLASS B.

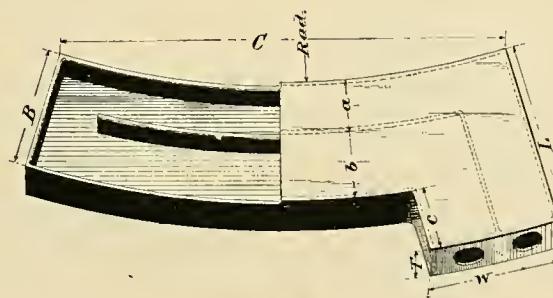


FIG. 724.  
BOSH PLATE.  
CLASS C.  
(POLLOCK'S PATENT.)

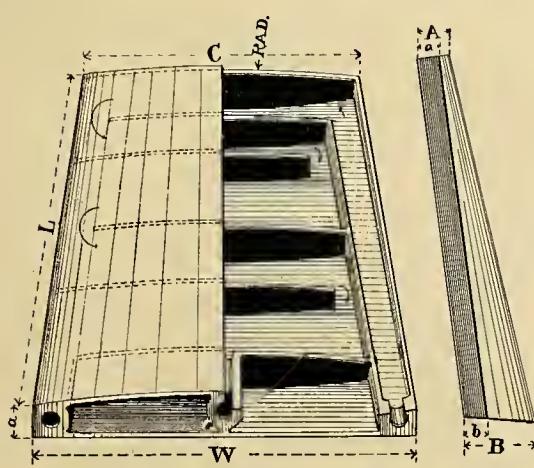


FIG. 725.  
BOSH PLATE.  
CLASS D.  
(SCOTT'S PATENT.)

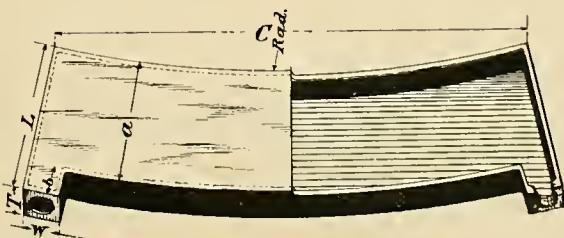


FIG. 726.  
BOSH PLATE.  
CLASS E.



See Catalogue F for Dimensions of Above.

## CLIMAX BRONZE BOSH PLATES, AND VALVE SEATS.

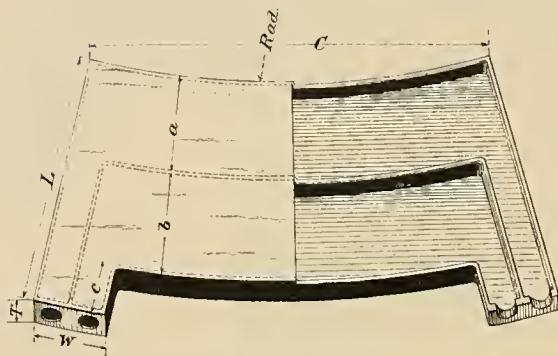


FIG. 727.  
BOSH PLATE.  
CLASS F.

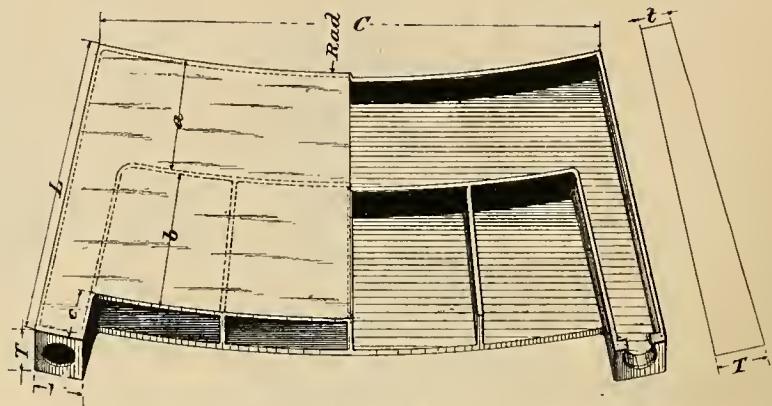


FIG. 728.  
BOSH PLATE.  
CLASS G. (GAYLEY'S PATENT.)

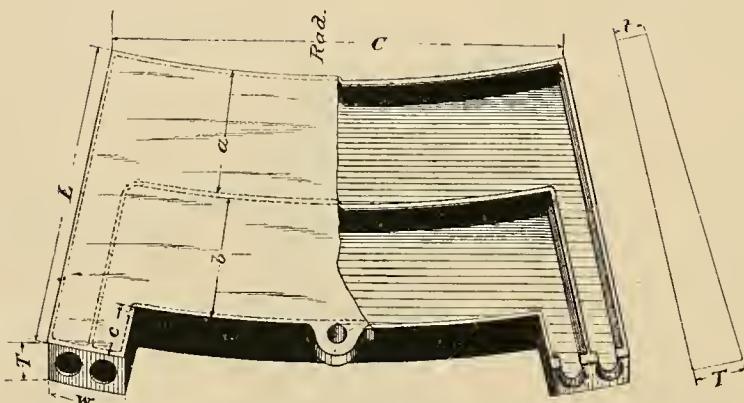


FIG. 729.  
BOSH PLATE.  
CLASS H. (GAYLEY'S PATENT.)

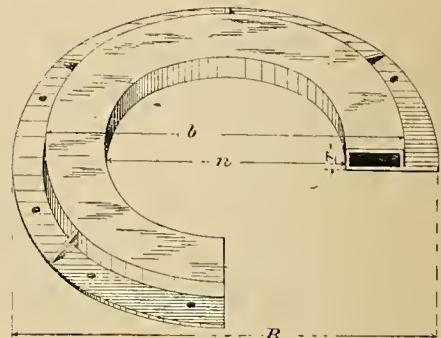


FIG. 730.  
VALVE SEAT.  
CLASS A.

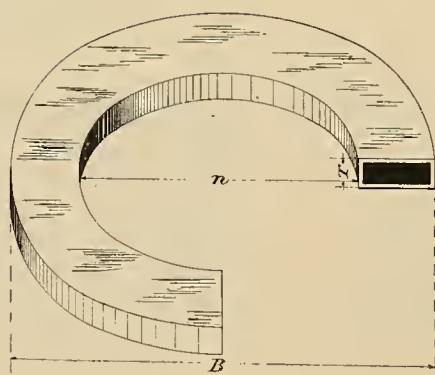


FIG. 731.  
VALVE SEAT.  
CLASS B.

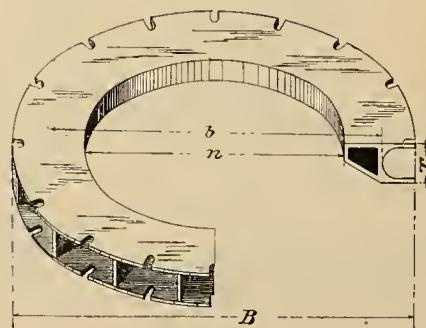


FIG. 732.  
VALVE SEAT.  
CLASS C.

See Catalogue F for Dimensions of Above.

## CLIMAX BRONZE VALVE SEATS AND VALVES.

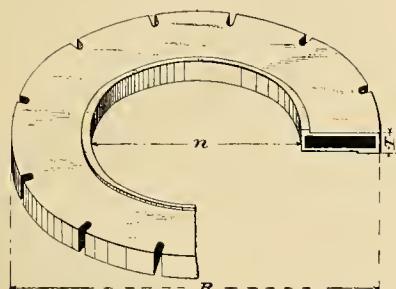


FIG. 733.  
**VALVE SEAT.**  
CLASS D.

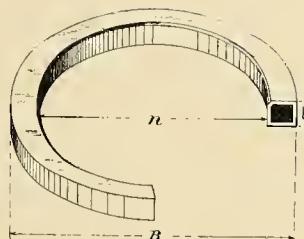


FIG. 734.  
**VALVE SEAT.**  
CLASS E.

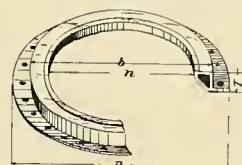


FIG. 735.  
**VALVE SEAT.**  
CLASS F.

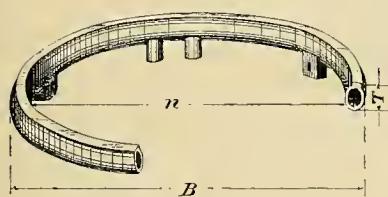


FIG. 736.  
**VALVE SEAT.**  
CLASS G.

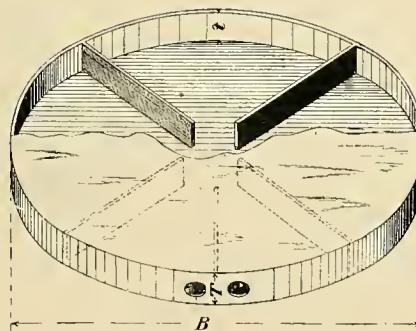


FIG. 737.  
**VALVE.**  
CLASS A.

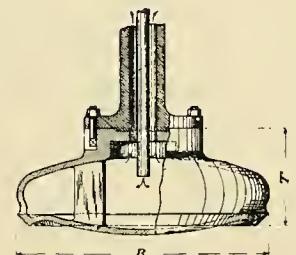


FIG. 738.  
**VALVE.**  
CLASS B.

See Catalogue F for Dimensions of above.

## WATER AND AIR COOLED DEVICES

OF ANY SHAPE MADE OF

**CLIMAX BRONZE,**  
SILVER, FOR  
COPPER,  
GLASS,  
STEEL  
AND IRON

**SMELTING FURNACES.**

CORRESPONDENCE SOLICITED.

BY-PASS FOR TANKS, HEATER EXHAUST, WATER TO BOILERS,  
AND STEAM MAINS.

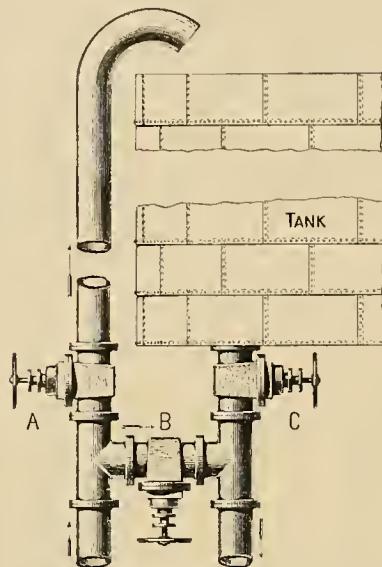


FIG. 739.  
**TANK BY-PASS.**



FOR TANKS.  
WITH COPPER FLOAT.

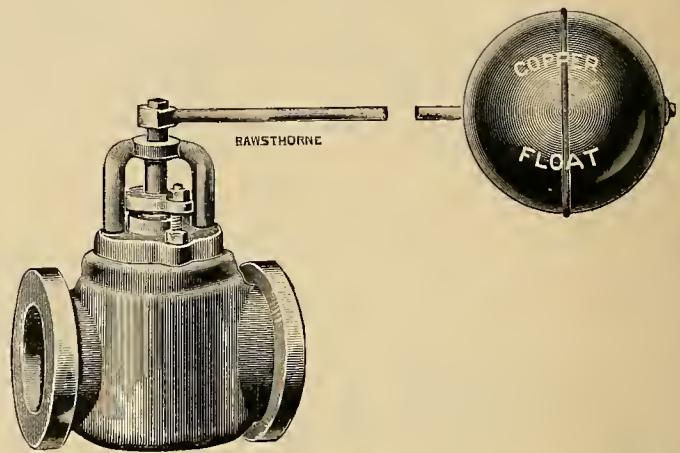


FIG. 739½.  
See also page 77.

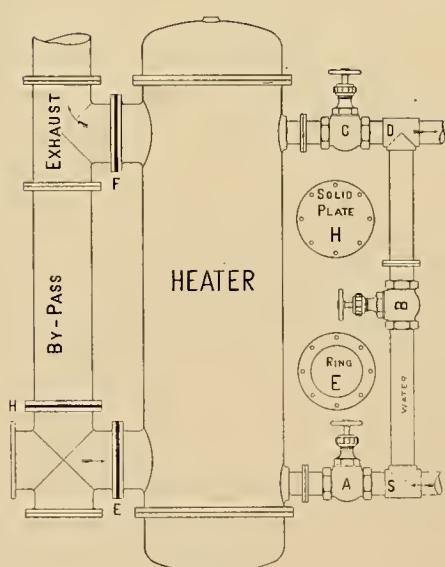


FIG. 740.  
HEATER BY-PASS.

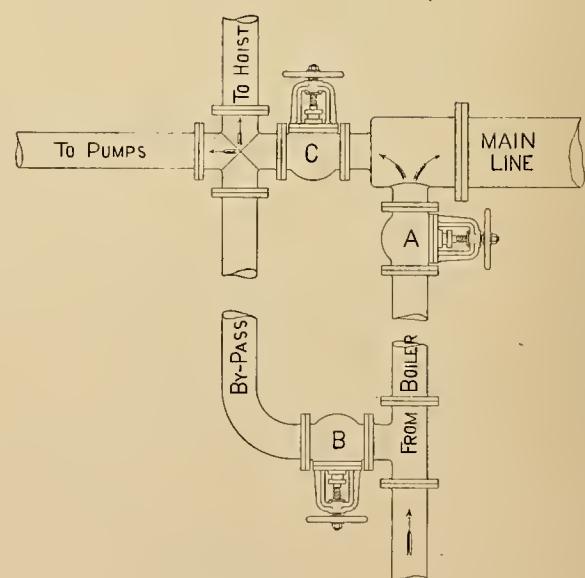


FIG. 741  
**STEAM LINE BY-PASS.**

### TANK BY-PASS.

Direct pressure from pump to furnace, independent of tank, is obtained, as shown by cut, by closing valves *A* and *C* and opening valve *B*. Tank can then be thoroughly cleaned. By-pass connection need not be placed close to tank. Any convenient point between lines to and from tank will answer for this purpose.

### HEATER BY-PASS.

*S* indicates the cold water supply to the heater. *D*, the hot water line from the heater. If the heater needs repairing, close valves *A* and *C* and open by-pass valve *B*. If exhaust connection is made to heater, as shown on the left of same, it can be by-passed by removing liner or rings *E* and *F* and putting in their places plate *H* and a spare plate same as *H*. Then no exhaust can get into heater.

Put ring *E* where *H* was and steam will pass direct from Cross up through Tee and into atmosphere.

Plates and rings *E*, *F* and *H* are made of bronze  $\frac{1}{4}$  or  $\frac{3}{8}$  inch thick, so as to prevent rusting and allowing ready removal.

This arrangement saves the expense of three valves and is very neat and compact.

### STEAM LINE BY-PASS.

In Blast Furnace practice it is often the case that steam is required only for the pumps and hoist, when the furnace is banked or not blowing, and it is not desirable to have steam in the entire main line. Using the main steam line for this purpose can be avoided by arranging pipe system as shown. Close valves *A* and *C* and steam can be furnished through valve *B*, by only firing one battery of boilers.

WE MANUFACTURE

# CLIMAX BRONZE CASTINGS,

Which we claim to be superior to any bronze in use, and guaranteed for the following purposes:

**Grade A.**—For Blast Furnace Tuyeres, Bosh Plates, etc.

**Grade B.**—For general machine castings, Piston Rods, Cog Wheels, Racks and Pinions, Pump Linings, Bolts, Step Bearings and Hydraulic Work of all kinds, **hard and strong**.

**Grade C.**—For Heated Rolls, Hydraulic Cranes, Nail Machines, etc., **very tough and hard**.

**Grade D.**—For Packing Rings, for all purposes **very strong**.

**Grade E.**—For Bells, Gongs, etc.

**Grade F.**—For Heavy Bearings for Rolls, Engines, Car Bearings, Locomotive Driving Boxes, Collar Bearings, Heavy Slides, etc. This grade is made **hard and strong**, so as to **resist great pressure**, and is of such a nature as not to cut the journals.

**Grade H.**—For work subject to acids, chemicals, etc. Designed to take the place of ordinary **acid metal**, being much harder and stronger.

“**Climax Bronze**” of any grade, **in ingots**, in large or small quantities, at a price that enables it to compete with any other Bronze in the market.

## PHOSPHORIZED INGOT COPPER.

Made of several grades to suit various purposes, **Guaranteed** to produce **Genuine Phosphor-Bronze Castings**, without additional mixture of metals.

## MATERIAL NOT ILLUSTRATED.

Cotton and Hemp Packing,  
Sheet Asbestos.  
Asbestos Rope Packing,  
Plumbago Packing,  
Gasket Board.  
Soil Pipe Fittings.  
Sewer Pipe and Fittings.  
Gaskets of any material.  
Chain Belting and Shives.

Brass, Copper, Steel and Iron Wire.  
Bar and Sheet Iron and Steel.  
Bar, Sheet and Spring Steel.  
Recording Gauges.  
Natural Gas Supplies.  
Crucibles and Plumbago.  
Phosphorus.  
Coal, Ore and Sand Screens.  
Thermometers.

# BEST, FOX & CO.'S

## DIMENSIONS

OF

# FITTINGS, VALVES, FLANGES,

STEEL, WROUGHT AND CAST IRON PIPE,

BRASS, COPPER AND LEAD PIPE,

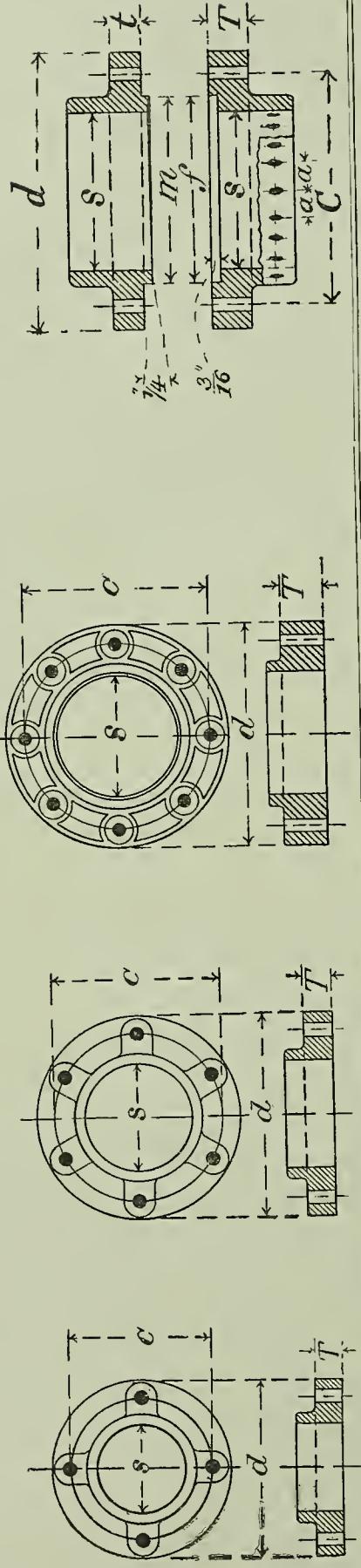
STEEL AND COPPER BENDS,

&c., &c.

For the Convenience of Engineers and Draughtsmen we have embodied in Pamphlet K these tables from  
Pages 100 to 114. Furnished on application.

# CAST IRON AND CAST STEEL FLANGES

FOR THREADED I. D. (INSIDE DIAM.) PIPE.



**A** LIGHT.  
SUITABLE FOR PRESSURE  
TO 50 LBS.

**B** MEDIUM.  
SUITABLE FOR PRESSURE  
TO 100 LBS.

**C** EXTRA HEAVY.  
SUITABLE FOR PRESSURE  
FROM 150 TO 300 LBS.

**D** EXTRA HEAVY.  
SUITABLE FOR PRESSURE  
FROM 150 TO 300 LBS.

s	a	HOLES.			T	Steel.	Holes.	No. Size.	C	Holes.	No. Size.	C	Holes.	No. Size.	C	Holes.	No. Size.	C	Holes.	No. Size.	C	Holes.	No. Size.	C					
		No.	Size.	c																									
2	6	4	5/8	4 1/2	7/8	2	1 1/8	4 1/2	1	1 1/8	2	1 1/8	4 1/2	1	1 1/8	5 1/2	10 9/16	1 1/2	1 1/2	5/8	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	
	6 1/2	4	5/8	5 1/2	7/8	2 1/2	1 1/8	5 1/2	1	1 1/8	3	1 1/8	5 1/2	1	1 1/8	6 1/2	1 1/2	1 1/2	1 1/2	5/8	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	
3	7	4	5/8	5 1/2	7 1/2	4	1 1/4	8 3/4	4	1 1/4	3	1 1/4	8 3/4	4	1 1/4	9 1/4	1 1/2	1 1/2	10 1/2	8 1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	
	7 1/2	4	5/8	5 1/2	8	3 1/2	1 1/4	9 1/4	6	1 1/4	3 1/2	1 1/4	9 1/4	6	1 1/4	10 1/2	1 1/2	1 1/2	20 1/2	12 1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	
4	8 1/2	4	5/8	6	3 1/2	4	1 1/8	9 1/2	4	1 1/8	7 1/2	1 1/8	9 1/2	4	1 1/8	11 1/4	1 1/2	1 1/2	14	22	12 1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	8 1/2	4	5/8	6	3 1/2	8 1/2	1 1/8	9 1/2	6	1 1/8	9 1/2	1 1/8	9 1/2	6	1 1/8	11 1/4	1 1/2	1 1/2	14	22	12 1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
4 1/2	9	6	3/4	7 1/4	1	4 1/2	1	7 1/4	1	1 1/4	1 1/4	1 1/4	7 1/4	1	1 1/4	10	6	3/4	8 1/4	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8		
	10	6	3/4	8 1/4	1	5	10	6	3/4	8 1/4	1 1/4	1 1/4	8 1/4	1	1 1/4	1 1/4	5	10	6	3/4	9 1/4	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
5	11	6	3/4	9 1/4	1	6	11	6	3/4	9 1/4	1 1/4	1 1/4	9 1/4	1	1 1/4	1 1/4	6	11	6	3/4	10 1/4	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
	12	6	3/4	10 1/4	1	7	12	6	3/4	10 1/4	1 1/8	1 1/8	10 1/4	1	1 1/4	1 1/4	7	12	6	3/4	11 1/4	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
6	13	6	7/8	11 1/4	1	8	14	8	7/8	11 1/4	1 1/4	1 1/4	11 1/4	1	1 1/4	1 1/4	8	14	8	7/8	12 1/4	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
	14	6	7/8	13 1/4	1	9	15	8	7/8	13 1/4	1 1/4	1 1/4	13 1/4	1	1 1/4	1 1/4	9	15	8	7/8	13 1/4	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
7	15	6	7/8	13 1/4	1	10	16	8	7/8	13 1/4	1 1/4	1 1/4	13 1/4	1	1 1/4	1 1/4	10	16	8	7/8	14 1/4	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
	16	8	7/8	14 1/4	1	11	17	8	7/8	14 1/4	1 1/4	1 1/4	14 1/4	1	1 1/4	1 1/4	11	17	8	7/8	15 1/4	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
8	17	8	7/8	15 1/4	1	12	18	10	7/8	15 1/4	1 1/4	1 1/4	15 1/4	1	1 1/4	1 1/4	12	18	10	7/8	16 1/4	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8

CAST IRON AND CAST STEEL HYDRAULIC FLANGES TO ORDER.

\* STEEL FLANGES (THREADED) ARE NOT RAISED HOLE.

See Page.....

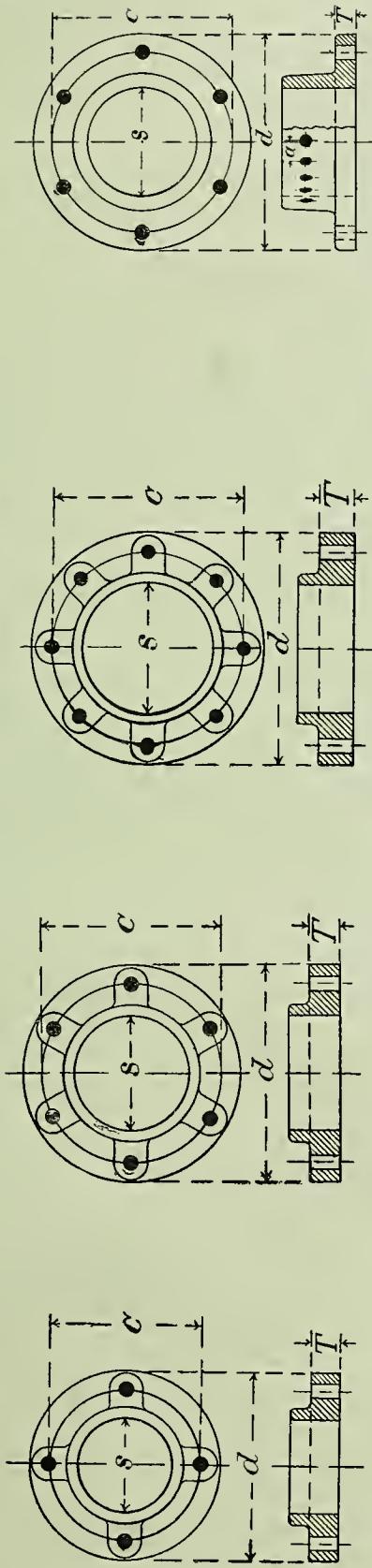
CAST IRON AND CAST STEEL HYDRAULIC FLANGES TO ORDER.

\* STEEL FLANGES (THREADED) ARE NOT RAISED HOLE.

## CAST IRON AND CAST STEEL FLANGES

For O. D. (OUTSIDE DIAM.) PIPE.

(BASED ON 10 YEARS PRACTICAL EXPERIENCE)



**F** **LIGHT.** **C** **MEDIUM.** **SUITABLE FOR PRESSURE TO 50 LBS.** **SUITABLE FOR PRESSURE TO 100 LBS.**

<b>C</b>	MEDIUM.	SUITABLE FOR PRESSURE TO 100 LBS.
<b>H</b>	HEAVY.	SUITABLE FOR PRESSURE TO 150 LBS.

**L**IGHT.  
FOR RIVETTED PIPE  
SUITABLE FOR EXHAUST, AIR, &c.

THE

FOR RIVETTED PIPE  
SUITABLE FOR EXHAUST, AIR, &c.

HOLES.		T		RIVETS.		
s	d	No.	Size.	C	Size.	a
8	1.3	6	7/8	1 1/4	1/4	1
10	1.6	8	7/8	1 4/14	3/8	1 1/4
12	1.7	8	7/8	1 5/14	7/8	1 1/4
	14	19 1/2	1	17 1/4	7/8	1 1/4
8	16	22	12	1	19 3/4	3/8
10	18	24	16	1	21 3/4	1
12	20	26	16	1	23 3/4	1
	22	28	20	1	25 3/4	1
8	24	30	20	1	27 3/4	1
10	32	20	1		30	1 1/4
12	34	24	1		32	1 1/4
	36 1/2	24	1		34 1/2	1 1/4
8	26	20	1		36	1 1/2
10	28	24	1		38	1 1/2
12	30	24	1		40 1/2	1 3/4
	36	32	1		42 1/2	1 3/4

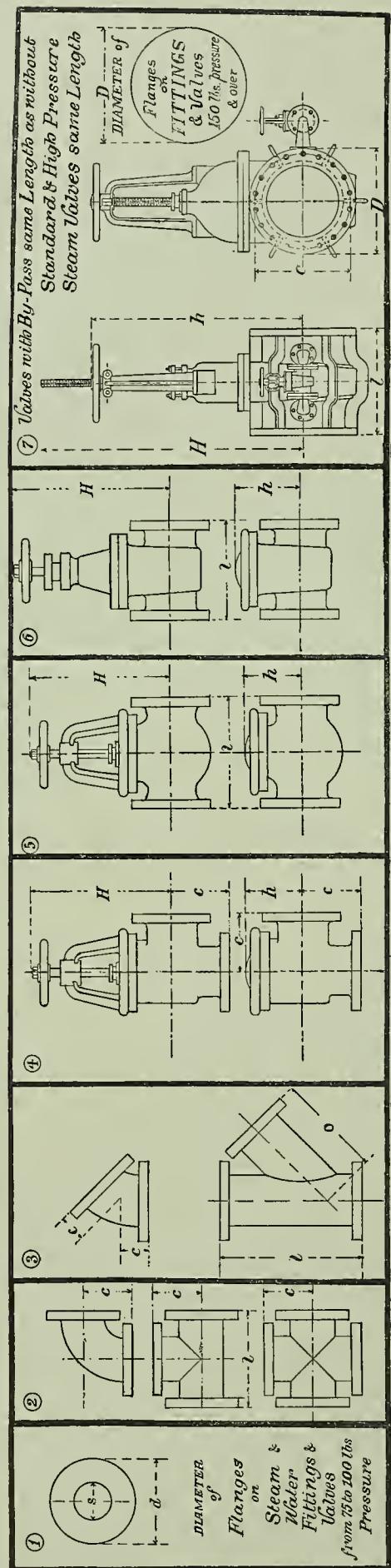
## FLANGES EXPANDED AND PINNED ON PIPE

\* STEEL FLANGES ARE NOT RAISED HOLE.

# BEST, FOX & COMPANY'S

## STANDARD DIMENSIONS OF

## ELANGED FITTINGS AND VALUES.



BEST'S PATENT GATE VALVES. HEAVY AND EXTRA HEAVY.											
CLIMAX GATE VALVES AND GLOBE STRAINERS.											
CLIMAX GLOBE VALVES AND GLOBE CHECK VALVES.											
DRILLING FOR EX. HY.											
FLANGES.	ELBOWS, TEES, CROSSES.	45° ELBOWS, Ys	CLIMAX ANGLE VALVES & ANGLE CHECK VALVES.	CLIMAX GLOBE VALVES AND GLOBE CHECK VALVES.	CLIMAX GATE VALVES AND GLOBE STRAINERS.	FLANGES.					
s	a	e	l	c	t	e	l	H	h	size.	FLANGES.
2	6	4 $\frac{3}{4}$	9 $\frac{1}{2}$	8 $\frac{3}{4}$	2 $\frac{1}{2}$	4	4 $\frac{1}{4}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	2	8 $\frac{1}{2}$
2 $\frac{1}{2}$	7	5	10	11 $\frac{1}{4}$	2 $\frac{5}{8}$	4 $\frac{1}{2}$	7 $\frac{1}{2}$	11 $\frac{1}{4}$	11 $\frac{1}{4}$	2 $\frac{1}{2}$	12 $\frac{1}{2}$
3	7 $\frac{1}{2}$	5 $\frac{1}{2}$	11	11 $\frac{3}{4}$	2 $\frac{3}{4}$	3	4 $\frac{1}{2}$	7 $\frac{3}{4}$	9 $\frac{1}{2}$	3	9 $\frac{1}{2}$
3 $\frac{1}{2}$	8	6	12	11 $\frac{3}{4}$	2 $\frac{3}{4}$	5 $\frac{1}{8}$	8 $\frac{3}{4}$	13 $\frac{1}{2}$	13 $\frac{1}{2}$	3 $\frac{1}{2}$	15 $\frac{1}{2}$
4	8 $\frac{1}{2}$	6 $\frac{3}{4}$	13	13 $\frac{1}{2}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	10 $\frac{1}{4}$	15 $\frac{1}{8}$	15 $\frac{1}{8}$	4	16 $\frac{1}{4}$
5	10	7 $\frac{3}{4}$	17	15 $\frac{1}{2}$	3 $\frac{3}{4}$	5	7 $\frac{1}{4}$	19 $\frac{1}{2}$	9 $\frac{3}{4}$	5	15
6	11	8 $\frac{1}{2}$	17	17	4	6	7 $\frac{1}{4}$	21 $\frac{1}{4}$	9	6	15 $\frac{7}{8}$
7	12	9	18	18	4 $\frac{1}{4}$	7	7 $\frac{1}{4}$	22 $\frac{1}{4}$	10	7	16 $\frac{1}{4}$
8	14	9 $\frac{3}{4}$	19	19 $\frac{1}{2}$	4 $\frac{1}{2}$	8	8 $\frac{1}{2}$	23 $\frac{1}{8}$	12 $\frac{1}{2}$	8	16 $\frac{1}{2}$
9	15	10 $\frac{1}{2}$	21	23 $\frac{1}{2}$	4 $\frac{7}{8}$	9	11	24 $\frac{1}{8}$	21 $\frac{1}{4}$	9	17
10	16	11 $\frac{1}{4}$	22	22 $\frac{1}{2}$	5 $\frac{1}{4}$	10	11 $\frac{3}{4}$	28	23 $\frac{1}{4}$	10	18
12	18	12 $\frac{1}{2}$	25	30	5 $\frac{3}{4}$	12	12 $\frac{1}{2}$	30	25 $\frac{3}{4}$	12	19 $\frac{3}{4}$
14	20	14	28	6 $\frac{1}{4}$	33 $\frac{3}{4}$	14	15	32	14	14	21 $\frac{1}{2}$
15	21	15	30	6 $\frac{3}{4}$	35 $\frac{1}{2}$	15	15 $\frac{3}{4}$	34 $\frac{1}{2}$	31 $\frac{3}{4}$	15	21 $\frac{1}{2}$
16	22	16	32	7 $\frac{1}{4}$	37	16	16 $\frac{3}{4}$	36 $\frac{1}{4}$	34	19	21 $\frac{1}{2}$
18	25	17	34	7 $\frac{3}{4}$	40 $\frac{1}{2}$	18	18 $\frac{1}{2}$	38 $\frac{1}{4}$	44	21	23 $\frac{1}{2}$
20	27	18	36	8	43 $\frac{1}{2}$	20	19 $\frac{3}{4}$	41	42 $\frac{1}{4}$	22	20
22	29	19	38	8 $\frac{1}{2}$	47 $\frac{1}{4}$	22	21	33 $\frac{1}{2}$	20	46 $\frac{1}{2}$	22
24	32	21	42	9 $\frac{1}{4}$	50 $\frac{1}{2}$	24	22 $\frac{1}{4}$	46 $\frac{1}{4}$	50 $\frac{3}{4}$	57 $\frac{1}{2}$	27 $\frac{5}{8}$

## DIMENSIONS OF EX-IM FINANCIAL LENDING TILAN ABOVE

BIMENSIONS OF EX. HY. FITTINGS ARE LONGER THAN ABOVE.

SETTINGS AND VALUES TO 60 INCH DIAM TO ORDER.

BEST, FOX & COMPANY'S

STANDARD DIMENSIONS OF

SCREWED FITTINGS AND VALVES

FOR MEDIUM AND HEAVY PRESSURES. (NOT EXTRA HEAVY.)

Size.	c	l	45° ELBOWS AND Y'S.			45° ELBOWS AND Y'S.			MANIFOLDS AND RETURN BENDS.			CLIMAX ANGLE AND CHECK VALVES			CLIMAX GLOBE AND CHECK VALVES			HINGE OR SWING CHECK VALVES				
			c	l	a	Size.	c	w	u	h	b	size.	c	h	u	h	b	l	u	h	b	l
1	1 1/2	3	3 1/8	2 1/2	2 3/8	1	1 1/8	2 3/8	1 5/8	1 1/2	1 1/2	1 1/4	3 1/4	4 1/2	2 1/2	1 1/2	1 1/2	2 1/2	1 1/4	3 1/2	1	
	1 1/4	3 1/4	3 1/2	2 1/2	2 3/4	1 1/4	4 3/4	2 3/4	3 1/8	2 1/4	2 1/4	2 1/4	4 1/2	5 1/2	2	1 1/2	1 1/2	4 1/4	4 1/4	2 3/4	1 1/4	
	1 1/2	1 7/8	3 3/4	1 1/2	2 1/2	1 1/2	4 1/5	2 1/2	3 1/2	2 1/2	2 1/2	2 1/2	7	2 1/2	4 1/2	1 1/2	4 1/2	5	1 1/2	3 1/2	1 1/2	
2	2	2 1/4	4 1/2	1 1/2	2 1/2	2	5 1/8	2 1/6	3 1/2	4	4 1/2	3 1/2	8	1 1/3	4 1/2	2 1/2	1 1/2	4 3/4	2 1/4	1 1/2	5 1/4	3 1/4
	2 1/2	2 3/4	5 1/2	1 3/4	6 1/2	2 1/2	4 7/8	4 3/8	7 1/8	3	5	4 7/8	2 1/2	4	1 1/4	3 1/4	8	2 1/2	1 1/2	5 1/4	3 1/4	
3	3 1/8	6 1/4	6 1/4	2 1/2	7 1/4	3 1/2	5	8 1/4	3 1/4	6	6 1/4	4 1/2	3 1/2	8 3/4	10 1/2	4	3 1/2	8	1 1/2	5 1/4	2 1/2	
	3 1/2	6 3/4	6 3/4	2 1/2	8 1/4	3 1/2	5 3/4	9 1/8	3 1/8	6 1/2	5	3 1/2	5 1/4	3 1/2	8 3/4	10 1/2	5	3 1/2	8	1 1/2	5 1/4	2 1/2
4	4 3/8	7 3/4	7 3/4	2 1/6	9 3/4	4	6 3/8	10 1/6	4 1/3	7	7	5 5/8	4	6 3/4	15 3/4	5 1/2	11	10 1/2	3 1/2	14 1/4	6 1/2	
	4 1/8	4 4/8	8 1/2	2 1/2	11 1/6	4 1/2	8 1/8	11 3/4	4 3/4	8	8	6 1/2	4 1/2	7	16 1/4	7	17	7 1/4	3 1/2	14 1/4	6 3/4	
5	5	8 3/4	8 3/4	1 1/4	9 1/6	5	7 3/4	12 1/6	4 1/3	9	9	7 1/4	5 1/2	17 1/2	6 1/2	13	19 1/2	8	16 1/4	7 1/4	5	
	6	10	10	3 1/6	13 1/2	6	9	14 9/16	5 1/8	10	10	8 1/2	6	8	20 1/2	7 1/4	15 1/4	21 3/4	9	17 1/2	7 3/4	
	7	5 3/4	5 3/4	1 1/2	11 1/6	7	10 1/4	16 5/16	6 1/6	11 1/2	11 1/2	9 3/4	7	9 1/2	22 3/4	8	18	23	9 3/4	18 1/2	6	
8	8	6 3/8	6 3/8	1 1/2	12 3/4	8	11 1/2	17 3/4	6 1/4	13	13	11	10	8 1/4	23 3/4	9	20	25 1/2	10 1/2	21 3/4	7	
	10	8 1/2	8 1/2	1 1/2	17 1/4	10	4 3/4	21 3/8	16 3/8	14	14	21 1/2	7 1/2	10	11 3/4	28	9 1/2	23	10 1/2	21 3/4	8	
12	12	9 3/8	9 3/8	1 1/2	18 3/4	12	15 1/2	25	9 1/2	18 1/2	12	12 1/2	16 1/2	12	12 1/2	30	12 3/4	25 3/4	32	14 1/2	15 1/4	

Size.	c	l	LONG RADIUS.			CLIMAX GLOBE AND CHECK VALVES			CLIMAX ANGLE AND CHECK VALVES			MANIFOLDS AND RETURN BENDS.			CLIMAX GLOBE AND CHECK VALVES			HINGE OR SWING CHECK VALVES				
			c	l	a	size.	c	h	u	h	b	size.	c	h	u	h	b	size.	c	h	b	
1	1 1/2	3	3 1/8	2 1/2	2 3/8	1	1 1/8	2 3/8	1 5/8	1 1/2	1 1/2	1 1/4	3 1/4	4 1/2	2 1/2	1 1/2	1 1/2	2 1/2	1 1/4	3 1/2	1	
	1 1/4	3 1/4	3 1/2	2 1/2	2 3/4	1 1/4	4 3/4	2 3/4	3 1/8	2 1/4	2 1/4	2 1/4	4 1/4	5 1/2	2	1 1/2	1 1/2	4 1/4	4 1/4	2 3/4	1 1/4	
	1 1/2	1 7/8	3 3/4	1 1/2	2 1/2	1 1/2	4 1/5	2 1/6	3 1/2	2 1/2	2 1/2	2 1/2	7	2 1/2	4 1/2	1 1/2	4 1/2	5	1 1/2	3 1/2	1 1/2	
2	2	2 1/4	4 1/2	1 1/2	2 1/2	2	5 1/8	2 1/6	3 1/2	4	4 1/2	3 1/2	8	1 1/3	4 1/2	4 1/2	7	2 1/2	1 1/2	5 1/4	3 1/4	
	2 1/2	2 3/4	5 1/2	1 3/4	6 1/2	2 1/2	4 7/8	4 3/8	7 1/8	3	5	4 7/8	2 1/2	4	1 1/4	3 1/4	8	2 1/2	1 1/2	5 1/4	3 1/4	
3	3 1/8	6 1/4	6 1/4	2 1/2	7 1/4	3 1/2	5	8 1/4	3 1/4	6	6 1/4	4 1/2	3 1/2	8 3/4	10 1/2	4	3 1/2	8	1 1/2	5 1/4	2 1/2	
	3 1/2	6 3/4	6 3/4	2 1/2	8 1/4	3 1/2	5 3/4	9 1/8	3 1/8	6 1/2	5	3 1/2	5 1/4	3 1/2	8 3/4	10 1/2	5	3 1/2	8	1 1/2	5 1/4	2 1/2
4	4 3/8	7 3/4	7 3/4	2 1/6	9 3/4	4	6 3/8	10 1/6	4 1/3	7	7	5 5/8	4	6 3/4	15 3/4	5 1/2	11	10 1/2	3 1/2	14 1/4	6 1/2	
	4 1/8	4 4/8	8 1/2	2 1/2	11 1/6	4 1/2	8 1/8	11 3/4	4 3/4	8	8	6 1/2	4 1/2	7	16 1/4	7	17	7 1/4	3 1/2	14 1/4	6 3/4	
5	5	8 3/4	8 3/4	1 1/4	9 1/6	5	7 3/4	12 1/6	4 1/3	9	9	7 1/4	5 1/2	17 1/2	6 1/2	13	19 1/2	8	16 1/4	7 1/4	5	
	6	10	10	3 1/6	13 1/2	6	9	14 9/16	5 1/8	10	10	8 1/2	6	8	20 1/2	7 1/4	15 1/4	21 3/4	9	17 1/2	7 3/4	
	7	5 3/4	5 3/4	1 1/2	11 1/6	7	10 1/4	16 5/16	6 1/6	11 1/2	11 1/2	9 3/4	7	9 1/2	22 3/4	8	18	23	9 3/4	18 1/2	6	
8	8	6 3/8	6 3/8	1 1/2	12 3/4	8	11 1/2	17 3/4	6 1/4	13	13	11	10	8 1/4	23 3/4	9	20	25 1/2	10 1/2	21 3/4	7	
	10	8 1/2	8 1/2	1 1/2	17 1/4	10	4 3/4	21 3/8	16 3/8	14	14	21 1/2	7 1/2	10	11 3/4	28	9 1/2	23	10 1/2	21 3/4	8	
12	12	9 3/8	9 3/8	1 1/2	18 3/4	12	15 1/2	25	9 1/2	18 1/2	12	12 1/2	16 1/2	12	12 1/2	30	12 3/4	25 3/4	32	14 1/2	15 1/4	

SCREWED FITTINGS TO 15 IN. INSIDE DIAM. ON HAND. SPECIAL VALVES FOR HYDRAULIC PRESSURE MADE OF CHARCOAL IRON OR BRONZE.

SCREWED STEEL FITTINGS TO ORDER. EXTRA WIDE RETURN BENDS TO ORDER.

SCREWED BRASS FITTINGS TO ORDER. DIMENSIONS OF 2 IN. VALVES AND SMALLER ARE BRASS.

SMALLEST RADIUS FOR IRON, STEEL AND COPPER BENDS AT WHICH PIPE WILL NOT BUCKLE.

TRANSFER VALVES.		LIGHT GATES for EXHAUST AIR, &c.		BUTTERFLY VALVES.		MINIMUM RADIUS OF SQUARE BENDS.		COPPER EXPANSION JOINTS.		PUMP STRAINERS.		LONG RADIUS FLANGED FITTINGS.		EXTRA LONG RADIUS ELBOWS.					
		<i>c</i>	<i>t</i>	<i>H</i>	<i>l</i>	<i>c</i>	<i>L</i>	<i>R</i>	<i>R</i>	<i>c</i>	<i>H</i>	<i>t</i>	<i>h</i>	<i>c</i>	<i>t</i>	<i>a</i>	<i>Size.</i>	<i>c</i>	
(16)	(17)	5 1/2	13	6 1/2	12 5/8	4 1/2	6 1/2	1 1/2	1 1/2	9	1"	2"	4	3 1/2	9	1 1/2	8 1/2	26 1/2	6
(18)	(19)	7	14	5 1/2	15 1/2	5 1/4	7 1/2	1 1/2	1 1/2	10	1 1/4	2 1/2	5	4	1 1/4	2' 6"	15	5 1/2	10
(20)	(21)	7 3/4	15 1/2	7	18	6	8 3/4	17 1/2	1 1/2	11 1/4	10	1 1/4	2 1/2	3	1 1/2	9 3/4	27 1/4	9	
(22)	(23)	8 1/2	17	7	19 3/4	7	10 1/2	12 1/2	1 1/2	12 1/2	10	1 1/2	2 1/2	3	1 1/2	10 3/4	29 3/4	8	
(24)	(25)	9 1/2	19	7 1/4	21 1/4	8	11 5/8	23 3/4	1 1/4	23 3/4	12	2 1/2	3	1 1/2	11 1/4	49 1/2	35 1/2	5	
(26)	(27)	10 1/2	21	7 3/4	25	9 3/4	15	30	17 1/2	3	6 1/2	6	8	1 1/2	1 1/2	49 1/2	6 3/4	7 1/2	
(28)	(29)	12	12	24	8	27 3/4	10 3/4	17	34	19	3 1/2	8	10	3 1/2	4 1/2	14 3/4	14	7 1/2	
(30)	(31)	14	13 1/2	27	9 1/2	32	12 1/4	19 1/4	38 1/2	21 3/4	4	10	12	20	4	5 ft.	2' 3"	16	
(32)	(33)	15	30	11 1/4	36 1/4	13 3/4	21	42	23 3/4	5	14	15	18	12	12	12	12	12	
(34)	(35)	16 1/2	33	12	41	15	23 3/4	47 1/2	2 1/2	52 1/2	6	18	18	22	2' 6"	6	17 1/2	17 1/2	
(36)	(37)	18	36	12 1/2	46 1/2	16 1/2	26 1/4	52 1/2	28	7	2' 1"	20	2' 4"	3	7	8 ft.	4' 6"	20	
(38)	(39)	19 3/4	39 1/2	14	51	18 1/2	29 1/4	58 1/2	30 1/2	8	2' 8"	20	2' 6"	3' 6"	8	10	12	16	16
(40)	(41)	21	42	15	55	19 1/4	31 1/2	63	32 1/2	10	3' 10"	3' 6"	3' 8"	4' 6"	10	12	14	16	18
(42)	(43)	24	42	15	55	19 1/4	31 1/2	63	32 1/2	12	5 ft.	4 ft.	6 ft.	5 ft.	12	14	14	16	23
(44)	(45)	14	6' 2"	4' 6"	7	ft.	6 ft.	14	6' 2"	4' 6"	7	ft.	6 ft.	7 ft.	14	16	16	16	24

Measurements given in Tables 16, 17 and 18 are for  
50 lbs. Pressure.  
Full area of pipe given is obtained through  
Butterfly Valves for HIGH PRESSURE,  
SPECIAL.  
DIAM. of FLANGES on TRANSFER VALVES and  
LIGHT GATES same as TABLE 25.

PREFER MAKING  
BENDS (IRON AND  
COPPER) LONGER  
RADIUS.

LARGER SIZE STRAINERS AND LONG RADIUS  
FITTINGS TO ORDER.

(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
<i>H</i>																		
<i>L</i>																		
<i>C</i>																		

TRANSFER VALVES.		LIGHT GATES for EXHAUST AIR, &c.		BUTTERFLY VALVES.		MINIMUM RADIUS OF SQUARE BENDS.		COPPER EXPANSION JOINTS.		PUMP STRAINERS.		LONG RADIUS FLANGED FITTINGS.		EXTRA LONG RADIUS ELBOWS.					
		<i>c</i>	<i>t</i>	<i>H</i>	<i>l</i>	<i>c</i>	<i>L</i>	<i>R</i>	<i>R</i>	<i>c</i>	<i>H</i>	<i>t</i>	<i>h</i>	<i>c</i>	<i>t</i>	<i>a</i>	<i>Size.</i>	<i>c</i>	
(16)	(17)	5 1/2	13	6 1/2	12 5/8	4 1/2	6 1/2	1 1/2	1 1/2	9	1"	2"	4	3 1/2	9	1 1/2	8 1/2	26 1/2	6
(18)	(19)	7	14	5 1/2	15 1/2	5 1/4	7 1/2	1 1/2	1 1/2	10	1 1/4	2 1/2	5	4	1 1/4	2' 6"	15	5 1/2	10
(20)	(21)	7 3/4	15 1/2	7	18	6	8 3/4	17 1/2	1 1/2	11 1/4	10	1 1/4	2 1/2	3	1 1/4	9 3/4	27 1/4	8	
(22)	(23)	8 1/2	17	7	19 3/4	7	10 1/2	12 1/2	1 1/2	12 1/2	10	1 1/2	2 1/2	3	1 1/2	10 3/4	29 3/4	5	
(24)	(25)	9 1/2	19	7 1/4	21 1/4	8	11 5/8	23 3/4	1 1/4	23 3/4	12	2 1/2	3	1 1/2	12 1/2	54	38 1/4	12	
(26)	(27)	10 1/2	21	7 3/4	25	9 3/4	15	30	17 1/2	3	6 1/2	6	8	1 1/2	1 1/2	54	42	14	
(28)	(29)	12	12	24	8	27 3/4	10 3/4	17	34	19	3 1/2	8	10	3 1/2	4 1/2	14 3/4	14	17 1/2	
(30)	(31)	14	13 1/2	27	9 1/2	32	12 1/4	19 1/4	38 1/2	21 3/4	4	10	12	20	4	5 ft.	2' 3"	16	
(32)	(33)	15	30	11 1/4	36 1/4	13 3/4	21	42	23 3/4	5	14	15	18	12	12	12	12	12	
(34)	(35)	16 1/2	33	12	41	15	23 3/4	47 1/2	2 1/2	52 1/2	6	18	22	2' 6"	6	7	14 3/4	14	
(36)	(37)	18	36	12 1/2	46 1/2	16 1/2	26 1/4	52 1/2	28	7	2' 1"	20	2' 4"	3	7	8 ft.	4' 6"	20	
(38)	(39)	19 3/4	39 1/2	14	51	18 1/2	29 1/4	58 1/2	30 1/2	8	2' 8"	20	2' 6"	3' 6"	8	10	12	16	
(40)	(41)	21	42	15	55	19 1/4	31 1/2	63	32 1/2	10	3' 10"	3' 6"	3' 8"	4' 6"	10	12	14	16	
(42)	(43)	24	42	15	55	19 1/4	31 1/2	63	32 1/2	12	5 ft.	4 ft.	6 ft.	5 ft.	12	14	14	16	
(44)	(45)	14	6' 2"	4' 6"	7	ft.	6 ft.	14	6' 2"	4' 6"	7	ft.	6 ft.	7 ft.	14	16	16	16	

## REDUCED FLANGED FITTINGS

For LIGHT, MEDIUM AND HEAVY PRESSURES, (not EX. H.Y.)

26		27		28		29	
<i>Any size Reduction Light or Heavy</i>		<i>Any size Reduction</i>		<i>Any size Reduction Light or Heavy</i>		<i>Any size Reduction</i>	
DIAMETER	g	Light	Platings	Light or Heavy	g	Light	Platings
Light	g	Platings	g	Light or Heavy	g	Light	Platings
Flanges	g	g	g	Flanges	g	Flanges	g
Valves	g	g	g	Valves	g	Valves	g

REDUCING TEES AND CROSSES  
REDUCING ON OUTLET.

LIGHT FLANGES.		REDUCING ELBOWS.		BULL HEAD TEES OR REDUCING ON RUN.		REDUCING TEES AND CROSSES REDUCING ON OUTLET.	
<i>s</i>	<i>a</i>	<i>size.</i>	<i>c</i>	<i>size.</i>	<i>t</i>	<i>c</i>	<i>size.</i>
2	6	7 $\frac{3}{4}$	4 $\frac{3}{4}$	12	24 $\frac{1}{2}$	11 $\frac{1}{2}$	5
2 $\frac{1}{2}$	6 $\frac{1}{2}$	8 $\frac{1}{2}$	5	14	26 $\frac{1}{2}$	13 $\frac{1}{4}$	10
3	7	9 $\frac{3}{4}$	5 $\frac{1}{2}$	5	16	28 $\frac{1}{2}$	13 $\frac{1}{4}$
3 $\frac{1}{2}$	7 $\frac{1}{2}$	3 $\frac{1}{2}$	6	16	28	13 $\frac{1}{4}$	10
4	8 $\frac{1}{2}$	4	11 $\frac{1}{4}$	6	18	30 $\frac{1}{2}$	14 $\frac{1}{4}$
4 $\frac{1}{2}$	9	5	13 $\frac{3}{4}$	7 $\frac{1}{2}$	20	32	14 $\frac{1}{4}$
5	10	6	14 $\frac{1}{2}$	8 $\frac{1}{2}$	16	29 $\frac{1}{2}$	15 $\frac{1}{4}$
6	11	7	16	9	18	30 $\frac{1}{2}$	15 $\frac{1}{4}$
7	12	8	17 $\frac{1}{2}$	8	20	33 $\frac{1}{2}$	15 $\frac{1}{4}$
8	13	9	18 $\frac{3}{4}$	8 $\frac{1}{2}$	24	37	15 $\frac{1}{4}$
9	15	10	20 $\frac{1}{4}$	10 $\frac{1}{2}$	16	29 $\frac{1}{2}$	15 $\frac{1}{4}$
10	16	12	23	12 $\frac{1}{2}$	18	34	16 $\frac{1}{2}$
12	17	14	25 $\frac{3}{4}$	14	20	34	16 $\frac{1}{2}$
14	19 $\frac{1}{2}$	15	26 $\frac{3}{4}$	15	24	40	17 $\frac{1}{2}$
15	20 $\frac{1}{2}$	16	29	16	18	34	16 $\frac{1}{2}$
16	22	18	32	17	12	23 $\frac{1}{2}$	10 $\frac{1}{4}$
18	24	20	34	18	12	23 $\frac{1}{2}$	11 $\frac{1}{4}$
20	26	22	35	19	10	21 $\frac{1}{2}$	10 $\frac{1}{4}$
22	28	24	38	21	6	20 $\frac{1}{2}$	10 $\frac{1}{4}$
24	30			8x	24	40	19 $\frac{1}{2}$

30		31		32		33	
<i>All Measurements same as Table 2</i>		<i>All Measurements same as Table 28</i>		<i>All Measurements same as Table 28</i>		<i>All Measurements same as Table 28</i>	
16x	10	12	13	14	15	16	17
14	12	13	14	15	16	17	18

To order sizes of Reducing Fittings correctly always give run first thus 6 reads 8x 4x6 Tee, 6 or 12x 8x10x6 Cross, 10 reads 12x8x10x6 Cross.

## LARGER FITTINGS SPECIAL.

ELBOWS WITH SIDE OUTLETS TO ORDER. STEEL FITTINGS TO ORDER.

B E S T H. F. O X &amp; C O.

## APPROXIMATE WEIGHT OF BOWL FITTINGS FOR CAST IRON PIPE.

ELBOWS.		45° Ls.		TEES.		CROSSES.		SLEEVES.		PLUGS.		REDUCERS.		REDUCING, TEES, CROSSES.		REDUCERS.		REDUCING, TEES, CROSSES.		
Size.	Weight.	Weight.	Weight.	Size.	Weight.	Weight.	Weight.	Size.	Weight.	Weight.	Size.	Weight.	Size.	Weight.	Size.	Weight.	Size.	Weight.	Size.	Weight.
3	34	30	76	3	104	20	5	3x2	35	76	90	14x6	285	545	570	570	570	570	570	
4	48	65	100	4	150	44	8	4x3	42	90	114	14x8	340	575	635	635	635	635	635	
6	110	85	150	6	200	65	12	6x4	95	130	150	14x10	430	650	750	750	750	750	750	
8	145	160	265	8	325	86	26	8x4	116	222	265	14x12	475	650	.....	.....	.....	.....	.....	
10	225	190	390	10	510	140	46	8x6	126	252	265	16x10	435	890	1010	1010	1010	1010	1010	
12	370	290	565	12	700	176	66	10x4	128	292	338	16x12	475	825	1025	1025	1025	1025	1025	
14	450	400	700	14	800	208	70	10x6	150	312	388	20x12	540	1025	1370	1370	1370	1370	1370	
16	525	510	790	16	1025	340	100	10x8	212	330	415	20x16	690	1115	.....	.....	.....	.....	.....	
20	900	740	1375	20	1790	500	150	12x4	230	460	525	24x20	745	.....	2020	2020	2020	2020	2020	
24	1400	1425	1875	24	2190	710	185	12x6	230	484	540	30x24	1300	2640	.....	.....	.....	.....	.....	
30	.....	2000	3025	30	.....	965	370	12x8	254	492	615	.....	.....	.....	.....	.....	.....	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	12x10	278	510	650	.....	.....	.....	.....	.....	.....	.....	.....	

OFFSETS, Ys, CAPS AND SPECIALS OF ALL SIZES AT SHORT NOTICE.

# STEEL OR WROUGHT IRON WELDED STEAM, GAS AND WATER PIPE.

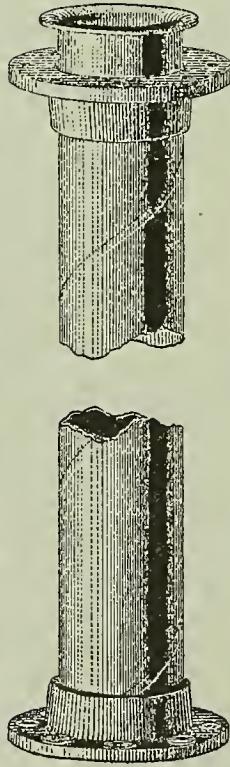
TABLE OF STANDARD DIMENSIONS.

Taper of Threads per inch of Screw,  $\frac{1}{32}$  inches from  $\frac{1}{8}$  to 9 inches, inclusive, and  $\frac{1}{64}$  from 10 inches up.

Nominal Internal. Inches.	Actual External. Inches.	Actual Internal. Inches.	CIRCUMFERENCE.			TRANSVERSE AREAS.			LENGTH OF PIPE PER SQ. FOOT OF			Nominal Weight per Foot.	Number of Threads per Inch of Screw.	Nominal Internal Diam.			
			THICK-NESS. Inches.	External. Inches.		Internal. Sq. inches.	Internal. Sq. inches.	Metal. Sq. inches.	External Surface. Feet.	Internal Surface. Feet.	Length of Pipe containing One Cubic Foot. Feet.						
				External. Inches.	Internal. Sq. inches.												
$\frac{1}{8}$	.40	.27	.068	1.27	.84	.13	.057	.071	9.44	14.15	2500.	.24	.27	$\frac{1}{8}$			
$\frac{1}{4}$	.54	.36	.088	1.69	1.14	.23	.104	.125	7.07	10.50	1385.	.42	.18	$\frac{1}{4}$			
$\frac{3}{8}$	.67	.49	.091	2.12	1.55	.35	.191	.166	5.65	7.67	751.5	.56	..	$\frac{3}{8}$			
$\frac{1}{2}$	.84	.62	.109	2.64	1.95	.55	.304	.249	4.50	6.13	472.4	.84	.4	$\frac{1}{2}$			
$\frac{5}{8}$	1.05	.82	.113	3.39	2.59	.86	.533	.332	3.63	4.63	270.	1.12	..	$\frac{5}{8}$			
$\frac{3}{4}$	1.31	1.04	.134	4.13	3.29	1.35	.862	.495	2.90	3.67	166.9	1.67	$1\frac{1}{2}$	$\frac{3}{4}$			
1														1			
$1\frac{1}{4}$	1.66	1.38	.14	5.21	4.33	2.16	1.496	.668	2.30	2.76	96.25	2.24	..	$1\frac{1}{4}$			
$1\frac{1}{2}$	1.9	1.61	.145	5.97	5.06	2.83	2.038	.797	2.01	2.37	70.65	2.68	..	$1\frac{1}{2}$			
2	2.37	2.06	.154	7.46	6.49	4.43	3.356	1.074	1.61	1.84	42.36	3.61	..	2			
$2\frac{1}{2}$	2.87	2.46	.204	9.03	7.75	6.49	4.784	1.788	1.32	1.54	30.11	5.74	8	$2\frac{1}{2}$			
3	3.5	3.06	.217	10.99	9.63	9.62	7.388	2.243	1.09	1.24	19.49	7.54	..	3			
$3\frac{1}{2}$	4	3.54	.226	12.56	11.14	12.56	9.887	2.679	.95	1.07	14.56	9.00	..	$3\frac{1}{2}$			
4	4.5	4.02	.237	14.13	12.64	15.90	12.73	3.174	.84	.94	11.31	10.66	..	4			
$4\frac{1}{2}$	5	4.50	.246	15.70	14.16	19.63	15.961	3.674	.76	.84	9.03	12.34	..	$4\frac{1}{2}$			
5	5.56	5.04	.259	17.47	15.85	24.30	19.99	4.316	.62	.75	7.20	14.50	..	5			
6	6.62	6.06	.28	20.81	19.05	34.47	28.888	5.584	.57	.63	4.98	18.76	..	6			
7	7.62	7.02	.301	23.95	22.06	45.66	38.738	6.926	.50	.54	3.72	23.27	..	7			
8	8.62	7.98	.322	27.09	25.07	58.42	50.04	8.386	.44	.47	2.88	28.18	..	8			
9	9.62	8.93	.344	30.23	28.07	72.76	62.73	10.03	.39	.42	2.26	33.70	..	9			
10	10.75	10.02	.366	33.77	31.47	90.76	78.839	11.924	.35	.38	1.80	40.06	..	10			
11	12	11.25	.375	37.79	35.34	113.09	99.402	13.696	.32	.34	1.50	45.	..	11			
12	12.75	11	.375	40.05	37.7	127.67	113.098	14.579	.30	.32	1.27	48.98	..	12			
13	14	13.25	.375	43.98	41.62	153.93	137.887	16.051	.27	.29	1.04	53.92	..	13			
14	15	14.25	.375	47.12	44.76	176.71	159.485	17.23	.25	.27	.90	57.89	..	14			
15	16	15.25	.375	50.26	47.91	201.06	182.655	18.407	.24	.25	.88	62.00	..	15			
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	
24																	

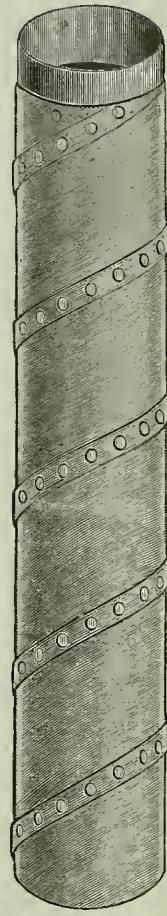
These sizes, as well as all sizes above 12 in. can be made of any thickness required. See Table page 112 for dimensions.

## SPIRAL WELD PIPE, WITH SLIP FLANGES.



DIAMETER INSIDE.	GRADE.	NOMINAL WEIGHT, Per ft. Lbs.	PROOF STRENGTH, Per Sq. Inch.
6	Standard	6.86	866
	Heavy	8.07	1106
8	Standard	9.12	650
	Heavy	10.78	830
10	Standard	13.74	664
	Heavy	16.73	872
12	Standard	17.11	553
	Heavy	20.71	727
14	Standard	21.07	474
	Heavy	25.27	623
16	Standard	32.03	545
	Heavy	36.69	670
18	Standard	38.83	484
	Heavy	41.96	596
20	Standard	39.49	436
	Heavy	45.37	536
22	Standard	49.67	396
	Heavy	55.95	487
24	Standard	53.39	363
	Heavy	60.28	446

## SPIRAL RIVETTED PIPE, WITH RIVETTED FLANGES, DOUBLE GALVANIZED.



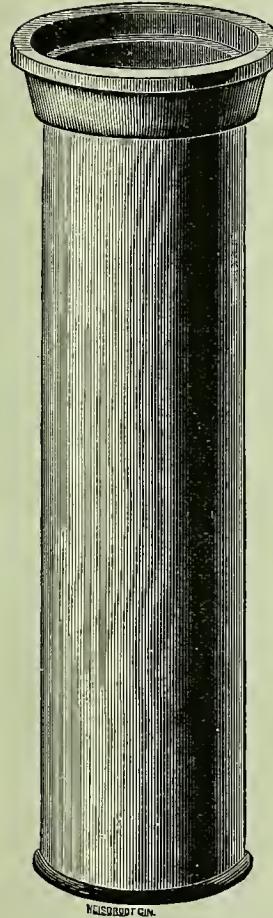
BEST, FOX & CO.

INSIDE DIAMETER IN INCHES.	THICKNESS BIRMINGHAM GAUGE.	NOMINAL WEIGHT PER FOOT.
3	No. 20	2 1/4 lbs.
4	"	3 "
5	"	4 "
6	No. 18	5 "
7	"	6 "
8	"	7 "
9	"	8 "
10	No. 16	11 "
11	"	12 "
12	"	14 "
13	"	15 "
14	No. 14	20 "
15	"	22 "
16	"	24 "
18	"	29 "
20	"	34 "
22	No. 12	40 "
24	"	50 "

*Pipe with Hub and Spigot or Sleeve to order. Descriptive Circular of Spiral Weld Pipe and Connections on Application.*

*Pipe with Crimped Ends, Sleeve or Slip Joints to order. Descriptive Circular of Spiral Riveted Pipe, Connections and Fittings on Application.*

## BOWL PIPE.



## CAST IRON

## GAS PIPE IN 12 FOOT LENGTHS.

**GAS PIPE IN 12 FOOT LENGTHS.**

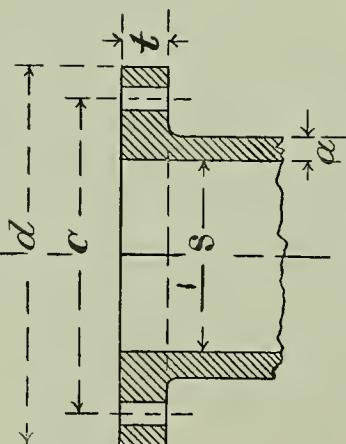
Diameter in Inches.	THICKNESS.		Approximate Weight Per Foot.
	Inches.	Approximate Inches.	
3	.31	$\frac{5}{16}$	11
4	.38	$\frac{3}{8}$	15
6	.4	$\frac{13}{32}$	25
8	.44	$\frac{7}{16}$	38
10	.44	$\frac{7}{16}$	50
12	.46	$\frac{15}{32}$	58
14	.53	$\frac{17}{32}$	80
16	.56	$\frac{9}{16}$	100
18	.63	$\frac{5}{8}$	125
20	.63	$\frac{5}{8}$	140
24	.72	$\frac{33}{32}$	185
30	.84	$\frac{27}{32}$	275
36	.95	$\frac{15}{16}$	375
48	1.04	1	550
60			

## WATER PIPE IN 12 FOOT LENGTHS.

**WATER PIPE IN 12 FOOT LENGTHS.**

**50 LBS. PER SQUARE INCH.  
116 FT. HEAD.  
100 LBS. PER SQUARE INCH.  
130 FT. HEAD.  
200 LBS. PER SQUARE INCH.  
130 300 FT. HEAD.**

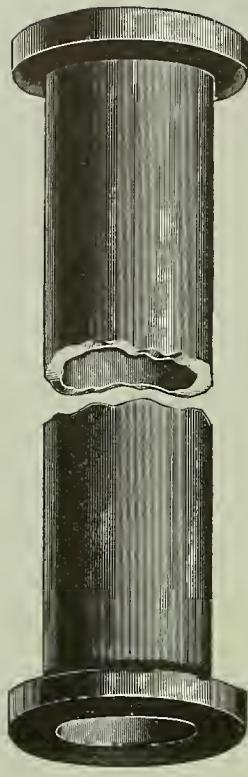
Thickness, Inches.	Approximate Weight Per Foot.	Thickness, Inches.		Approximate Weight Per Foot.	Thickness, Inches.	Approximate Weight Per Foot.	Thickness, Inches.	Approximate Weight Per Foot.	Thickness, Inches.	Approximate Weight Per Foot.
		Approximate Inches.	Approximate Inches.		Approximate Inches.		Approximate Inches.		Approximate Inches.	
.385	.38	14.5	.407	15	.419	17	15	.419	17	17
.403	1 $\frac{3}{2}$	18.5	.431	21	.448	22	1 $\frac{7}{16}$	.448	1 $\frac{7}{16}$	22
.438	1 $\frac{7}{8}$	30	.480	33	.505	34	1 $\frac{1}{2}$	.505	1 $\frac{1}{2}$	34
.473	1 $\frac{1}{2}$	42	.529	47	.562	50	1 $\frac{9}{16}$	.562	1 $\frac{9}{16}$	50
.508	1 $\frac{1}{2}$	55	.578	63	.619	67	1 $\frac{9}{32}$	.619	1 $\frac{9}{32}$	67
.543	1 $\frac{9}{16}$	71	.627	82	.677	88	1 $\frac{1}{8}$	.677	1 $\frac{1}{8}$	88
.578	1 $\frac{9}{32}$	87	.675	102	.734	111	1 $\frac{1}{16}$	.734	1 $\frac{1}{16}$	111
.617	5 $\frac{1}{8}$	108	.728	127	.794	137	1 $\frac{3}{16}$	.794	1 $\frac{3}{16}$	137
.648	2 $\frac{1}{32}$	127	.773	152	.848	166	2 $\frac{5}{32}$	.848	2 $\frac{5}{32}$	166
.683	1 $\frac{1}{16}$	150	.822	180	.905	200	3 $\frac{1}{32}$	.905	3 $\frac{1}{32}$	200
.753	3 $\frac{1}{4}$	196	.920	240	1.02	265	1 $\frac{1}{16}$	1.02	1 $\frac{1}{16}$	265
.858	7 $\frac{1}{8}$	275	1.067	345	1.19	384	1 $\frac{7}{32}$	1.19	1 $\frac{7}{32}$	384
.963	3 $\frac{1}{2}$	370	1.213	470	1.36	527	1 $\frac{1}{32}$	1.36	1 $\frac{1}{32}$	527
1.173	1 $\frac{3}{16}$	607	1.507	777	1.71	880	1 $\frac{11}{16}$	1.71	1 $\frac{11}{16}$	880
1.411	1 $\frac{7}{16}$	910	2.	1,328	2.25	1,500	2 $\frac{1}{4}$	2.25	2 $\frac{1}{4}$	1,500



DIMENSIONS OF

## CAST IRON FLANGED PIPE,

FOR WATER PRESSURE.



P-100 LBS.

P-150 LBS.

P-200 LBS.

P-300 LBS.

Inside Diam.	Size of Bolts.	No. of Bolts.	P-100 LBS.						P-150 LBS.						P-200 LBS.						P-300 LBS.													
			a	t	c	d	Wt.	a	t	c	d	Wt.	a	t	c	d	Wt.	a	t	c	d	Wt.	a	t	c	d	Wt.							
4	1/4	5/8	6	1/2	3/4	7	8 1/2	23.4	1/2	3/4	7	8 1/2	23.4	1/2	3/8	7	8 1/2	23.6	1/2	1 1/2	7	8 1/2	23.7	4	1/2	1 1/2	7	8 1/2	23.7					
4 1/2	1/4	5/8	6	1/2	1 3/8	7 1/2	9	26.	1/2	1 3/8	7 1/2	9	26.	1/2	1 3/8	7 1/2	9	26.1	1/2	1 1/2	7 1/2	9	26.2	4 1/2	5	1/2	1 1/2	7 1/2	9	26.2	4 1/2			
5	1/4	5/8	6	1/2	1 3/8	8	10	28.8	1/2	1 3/8	8	10	28.8	1/2	1 3/8	8	10	29.1	1/2	1	8	10	29.3	5	1/2	1 3/8	8	10	29.3	5				
6	1/4	3/4	6	1/2	1 3/8	9 1/4	11	34.	1/2	1 3/8	9 1/4	11	34.	1/2	1 3/8	9 1/4	11	34.6	1/2	1 3/8	9 1/4	11	34.9	6	1/2	1 3/8	9 1/4	11	34.9	6				
7	1/4	3/4	6	1/2	1 3/8	10 3/8	13	45.1	1/2	1 3/8	10 3/8	13	45.1	1/2	1 3/8	10 3/8	13	46.	1/2	1 3/8	10 3/8	13	46.3	7	1/2	1 3/8	10 3/8	13	46.3	7				
8	1/4	3/4	8	5/8	1	11 1/2	14	57.3	5/8	1	11 1/2	14	57.3	5/8	1	11 1/2	14	57.9	5/8	1	11 1/2	14	58.4	5/8	1	11 1/2	14	58.4	5/8	1	11 1/2	14	58.9	8
9	1/4	3/4	8	1 1/8	1	12 5/8	15	69.6	1 1/8	1	12 5/8	15	69.6	1 1/8	1	12 5/8	15	70.3	1 1/8	1	12 5/8	15	70.8	1 1/8	1	12 5/8	15	71.3	9					
10	1/4	3/4	10	2 1/4	1	13 3/4	16	83.6	1 1/8	1	13 3/4	16	83.8	1 1/8	1	13 3/4	16	84.6	1 1/8	1	13 3/4	16	85.2	3/4	1	13 3/4	16	85.7	10					
11	1/4	3/4	10	2 1/4	1	14 3/4	17	91.2	1 1/8	1	14 3/4	17	91.7	1 1/8	1	14 3/4	17	92.6	1 1/8	1	14 3/4	17	93.4	1 1/8	1	14 3/4	17	96.9	11					
12	1/4	3/8	12	3/4	1	14	16	19	1 1/4	1	14	16	19	1 1/4	1	14	16	19	1 1/4	1	14	16	19	1 1/4	1	14	16	19	1 1/4	1				
13	1/4	7/8	12	3/4	1 1/8	17	20	108.8	1 1/8	1 1/8	17	20	110.5	1 1/8	1 1/8	17	20	111.7	1 1/8	1 1/8	17	20	121.9	1	1 1/8	1 1/8	17	20	148.8	13				
14	1/4	7/8	14	3/4	1 1/8	18	21	116.7	1 3/8	1 1/8	18	21	118.4	1 3/8	1 1/8	18	21	119.7	1 3/8	1 1/8	18	21	139.5	1 1/8	1 3/8	1 1/8	18	21	169.7	14				
15	1/4	7/8	14	3/4	1 1/8	19	22	124.1	1 7/8	1 1/8	19	22	126.4	1 7/8	1 1/8	19	22	127.7	1 5/8	1 1/8	19 3/8	22	160.	1 7/8	1 1/8	19 3/8	22	191.3	15					
16	1/4	7/8	16	3/4	1 3/8	20	23	133.	1 7/8	1 1/8	20	23	134.	1 7/8	1 1/8	20 1/8	23	147.	1	1 7/8	20 1/2	23	180.	1 3/8	2	20 7/8	23	214.	16					
18	1/8	1	18	1 3/8	22 1/2	25	164.6	1 1/8	1 1/8	22 1/2	25	167.7	1 1/8	1 1/8	22 5/8	26	180.6	1 1/8	1 1/8	23 1/8	26	231.3	1 1/8	1 1/8	23 1/8	26	269.2	18						
20	1/8	1	20	1 7/8	24 5/8	28	195.2	1 7/8	1 3/4	24 5/8	28	198.5	1	2	24 7/8	28	227.4	1 1/4	2 3/8	25 3/8	28	281.7	1 1/4	2 3/8	25 3/8	28	334.5	20						
22	1/8	1	22	2 1/8	26 5/8	30	213.1	2 1/8	1 1/8	26 5/8	30	216.7	1 1/8	2 1/8	27 1/8	30	278.6	1 3/8	2 1/8	27 5/8	31	342.6	1 5/8	2 1/8	28 1/8	31	406.	22						
24	3/8	1/8	24	2 1/8	29 5/8	32	250.3	1 1/8	2 1/8	29 5/8	32	254.9	1 1/8	2 1/8	29 5/8	33	325.4	1 1/2	2 9/16	30 9/16	33	406.4	1 1/8	2 1/8	29 5/8	34	468.3	24						
26	3/8	1/8	26	1	31 1/4	34	288.1	1	2 1/8	31 1/4	34	292.9	1 5/8	2 1/8	31 1/4	35	391.1	1 5/8	2 1/8	32 1/2	36	482.2	1 1/8	2 1/8	32 1/2	36	572.3	26						
28	3/8	1/8	28	1	33 3/8	37	337.5	1 3/8	2 1/2	33 3/8	37	433.	1 3/4	2 3/4	34 3/4	38	554.3	2 1/8	3 3/8	35 1/2	39	669.3	28	3 3/8	35 1/2	39	669.3	28						
30	1/2	1/4	30	1	35 3/4	39	338.8	1 1/8	2 7/8	36	39	384.9	1 1/2	2 1/2	36 3/4	40	513.9	1 7/8	3 1/6	37 1/2	41	644.5	2 1/4	3 3/8	38 1/4	42	782.1	30						

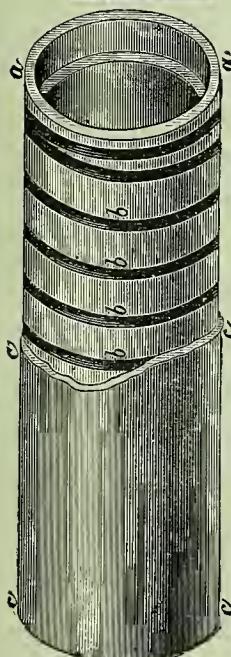
Figures Underlined — are greater than obtained by formula.

P-Pressure.

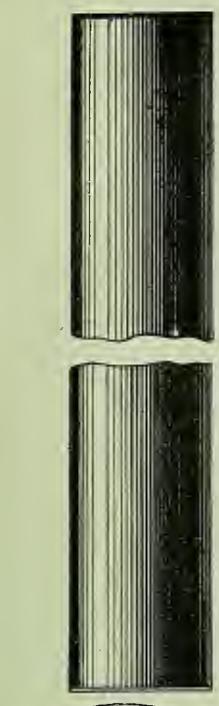
Approximate Wt. per ft. in 12 ft. lengths. (Flanges included.)



LIGHT CAST IRON SOIL  
PIPE.



WOOD WATER PIPE  
STRENGTHENED.



LIGHT ARTESIAN CASING,  
WITH THREAD AND SOCKET.

SIZE.	Standard, Wt. per Foot.	Extra Heavy, Wt. per Foot.	Size Internal.	Size External.	Weight per Foot. Lbs.	Proof Strength, Per Square Inch.	Nominal Inside Diameter, Inches.	Actual Outside Diameter, Inches.	Nominal Weight per Foot, Pounds.	Number of Threads per Inch of Screw.
2	1 1/4	3 1/2					2	2 1/4	2.23	1 1/4
3	1 1/2	3 1/2					2 1/4	2 1/2	2.75	1 1/4
4	2	4 1/2					2 1/2	2 3/4	3.00	1 1/4
5	3	5 1/2					2 3/4	3	3.33	1 1/4
6	3	6					3	3 1/4	3.95	1 1/4
7	4	7					3 1/4	3 1/2	4.27	1 1/4
8	4 1/2	8 1/2					3 1/2	3 3/4	4.60	1 1/4
9	5	9 1/2					3 3/4	4	5.33	1 1/4
10	6	10					4	4 1/4	5.50	1 1/4
11	7	11					4 1/4	4 1/2	6.00	1 1/4
12	8	12					4 1/2	4 3/4	6.50	1 1/4
13	9	13					4 3/4	5	7.25	1 1/4
14	10	14					5	5 1/4	7.66	1 1/4
15	11	15					5 1/4	5 1/2	8.08	1 1/4
16	12	16					5 1/2	6	9.35	1 1/4
17	13	17					5 1/2	6 5/8	10.06	1 1/4
18	14	18					6 5/8	7	12.45	1 1/4
19	15	19					6 1/4	7 1/4	13.50	1 1/4
20	16	20					6 1/4	7 5/8	15.10	1 1/2
21	17	21					8 1/4	8 5/8	16.15	1 1 1/2
22	18	22					8 5/8	9	17.25	1 1 1/2
23	19	23					9 5/8	10	19.00	1 1 1/2

Grade I to stand 160 pounds.

C. D. (Outside Diam.) LAP WELD

## STANDARD SIZES AND DIMENSIONS.



## PIPE OR BOILER TUBES.

DIMENSIONS NOT GIVEN  
MADE TO ORDER.

Diameter.	Thickness.		Circumference.		Transverse Areas.		Length of Pipe Per Sq. Ft. of Surface.		Nominal Weight Per Foot. Pounds.	External Diameter.
	External. Inches.	Internal. Inches.	Standard Inches.	Nearest Birmingham Wire Gauge.	External. Inches.	Internal. Inches.	External. Sq. Inches.	Internal. Sq. Inches.		
1	0.85	.072	.5	3 1/4	2.68	0.78	0.57	3.81	.70	1 1/4
1 1/4	1.10	.072	.5	3 9/16	3.47	1.22	0.96	3.05	.90	1 1/2
1 1/2	1.33	.083	.4	4 7/16	4.19	1.76	1.39	2.54	1.24	1 3/4
1 3/4	1.56	.095	.3	5 49/64	4.90	2.40	1.91	2.18	1.66	2
2	1.80	.095	.3	6.28	5.66	3.14	2.55	1.90	1.91	1 3/4
2 1/4	2.05	.095	.3	7.06	6.48	3.97	3.31	1.69	1.85	2 1/4
2 1/2	2.28	.109	.2	7.85	7.17	4.90	4.09	1.52	1.67	2 1/2
2 3/4	2.53	.109	.2	8.63	7.95	5.94	5.03	1.39	1.50	2 3/4
3	2.78	.109	.2	9.42	8.74	7.06	6.08	1.27	1.37	3
3 1/4	3.01	.120	.1	10.21	9.46	8.29	7.12	1.17	1.26	3 1/4
3 1/2	3.26	.120	.1	10.99	10.24	9.62	8.35	1.09	1.17	3 1/2
3 3/4	3.51	.120	.1	11.78	11.03	11.04	9.68	1.01	1.08	3 3/4
4	3.74	.134	.0	12.56	11.75	12.56	10.99	.95	1.02	4
4 1/2	4.24	.134	.0	14.13	13.32	15.90	14.12	.84	.90	4 1/2
5	4.72	.148	.9	15.70	14.81	19.63	17.49	.76	.80	5
6	5.69	.165	.8	18.84	17.90	28.27	25.50	.63	.67	6
7	6.65	.165	.8	21.99	20.91	38.48	34.80	.54	.57	7
8	7.63	.165	.8	25.13	23.98	50.26	45.79	.47	.50	8
9	8.61	.180	.7	28.27	27.05	63.61	58.29	.42	.44	9
10	9.57	.203	.6	31.41	30.07	78.34	71.97	.38	.39	10
11	10.56	.220	.5	34.55	33.17	95.03	87.47	.34	.36	11
12	11.54	.229	4 1/2	37.69	36.26	113.09	103.74	.31	.33	12
13	12.52	.238	4	40.84	39.34	132.73	123.18	.29	.30	13
14	13.50	.248	3 1/2	43.98	42.41	153.93	143.18	.27	.28	14
15	14.48	.259	3	47.12	45.49	176.71	164.71	.25	.26	15
16	15.45	.270	2 1/2	50.26	48.56	201.06	187.66	.23	.24	16
17	16.43	.284	2	53.40	51.66	226.98	212.22	.22	.23	17
18	17.41	.292	1 1/2	56.54	54.71	254.46	238.22	.21	.21	18
19	18.40	.300	1	59.69	57.80	283.52	265.90	.20	.20	19
20	19.36	.320	0 1/2	62.83	60.82	314.15	294.37	.19	.19	20
21	20.32	.340	0	65.97	63.83	346.36	324.31	.18	.18	21

TUBES TO 30 IN. DIAMETER FURNISHED.

TUBES HEAVIER OR LIGHTER THAN ABOVE MADE TO ORDER.

(X) EXTRA STRONG-STEEL OR WROUGHT-IRON WELDED PIPE.  
STANDARD SIZES AND DIMENSIONS. (Dimensions not given Made to Order.)

Nominal Inside. Inches.	Actual Inside. Inches.	Actual Outside. Inches.	THICKNESS. Inches.	CIRCUMFERENCE.		TRANSVERSE AREAS.			LENGTH OF PIPE PER SQ. FOOT OF...	NOMINAL WT. PER FOOT OF LENGTH.	NOMINAL INSIDE DIAM.
				Internal. Inches.	External. Inches.	External. Sq. inches.	Internal. Sq. inches.				
1/8	.20	.40	.10	.64	1.27	.03	9.43	18 1/3	.29	1/8	1/8
1/4	.29	.54	.12	.92	.22	.06	7.07	12 9/8	.54	1/4	1/4
3/8	.42	.67	.12	1.32	2.12	.13	5.65	9 07	.74	3/8	3/8
1/2	.54	.84	.14	1.70	2.63	.23	4.54	7.04	1.09	1/2	1/2
3/4	.73	1.05	.15	2.31	3.29	.45	3.63	5.10	1.53	3/4	3/4
1	.95	1.31	.18	2.98	4.13	.71	2.90	4.01	2.17	1	1
1 1/4	1.27	1.66	.19	3.99	5.21	1.27	2.30	3.00	3.00	1 1/4	1 1/4
1 1/2	1.49	1.9	.20	4.69	5.96	2.83	2.01	2.55	3.63	1 1/2	1 1/2
2	1.93	2.37	.22	6.07	7.46	4.43	1.60	1.97	5.02	2	2
2 1/2	2.31	2.87	.28	7.27	9.03	6.49	4.20	1.32	7.67	2 1/2	2 1/2
3	2.89	3.50	.30	9.08	10.99	9.62	6.56	1	10.25	3	3
3 1/2	3.35	4.00	.32	10.54	12.56	12.56	8.85	.95	11.13	12.47	3 1/2
4	3.81	4.50	.34	11.99	14.13	15.90	11.44	.84	1.00	14.97	4
4 1/2	4.25	5.00	.35	13.35	15.71	19.63	14.18	.76	9.90	17.60	4 1/2
5	4.81	5.56	.37	15.12	17.47	24.30	18.19	.68	.79	20.54	5
6	5.75	6.62	.43	18.06	20.81	34.47	25.93	.57	.66	28.58	6
7	6.62	7.62	.50	20.81	23.95	45.66	34.47	.50	.58	37.60	7
8	7.50	8.62	.56	23.56	27.10	58.42	44.18	.44	.51	47.85	8
(XX) DOUBLE EXTRA STRONG STEEL OR WROUGHT-IRON WELDED PIPE.											
3 1/2	.23	.22	.73	.04				15.69	.96	3/8	3/8
4	.24	.29	.76					15.66	1.5	1/2	1/2
4 1/2	.42	.31	1.32	.13				9.04	2.3	3/4	3/4
5	.58	.36	1.84	.27				6.51	3.4	1	1
6	.88	.38	2.78	.61				4.51	5	1 1/4	1 1/4
7	1.08	.40	3.41	.93				3.51	6.45	1 1/2	1 1/2
8	1.49	.44	4.68	1.74				2.56	9.48	2	2
	1.75	.56	5.51	2.41				2.17	13.3	2 1/2	2 1/2
3	2.28	.60	7.17	4.09				1.67	17.7	3	3
3 1/2	2.71	.64	8.53	5.79				1.4	22	3 1/2	3 1/2
4	3.13	.68	9.85	7.72				1.21	24.7	4	4
4 1/2	3.56	.72	11.2	9.96				1.05	32.45	4 1/2	4 1/2
5	4.06	.75	12.76	12.96				.94	37.1	5	5
6	5.06	.78	15.89	20.1				.78	50.1	6	6
7	5.98	.82	18.83	28.16				.62	60.34	7	7
8	6.88	.87	21.61	37.17				.56	71.52	8	8
SAME AS EXTRA HEAVY.											
SAME AS EXTRA HEAVY.											
SAME AS EXTRA HEAVY.											
SPECIAL HYDRAULIC PIPE TO ORDER.											

## BRASS AND COPPER PIPE. (Seamless Drawn.)

## LEAD PIPE.

114

BEST, FOX & CO.

### IRON PIPE SIZES.

Iron Pipe. Size.	Inside Diameter.	Outside Diameter.	Approximate Weight Per Foot.		
			BRASS.	COPPER.	
$\frac{1}{8}$	.27	$\frac{1\frac{3}{8}}{3\frac{1}{2}}$	.30	.31	
$\frac{1}{4}$	.36	$\frac{9}{16}$	.43	.45	
$\frac{3}{8}$	.49	$\frac{11}{16}$	.58	.61	
$\frac{1}{2}$	.62	$\frac{13}{16}$	.8	.84	
$\frac{3}{4}$	.82	$1\frac{1}{16}$	1.17	1.23	
1	1.04	$1\frac{5}{16}$	1.67	1.75	
$1\frac{1}{4}$	1.38	$1\frac{5}{8}$	2.42	2.54	
$1\frac{1}{2}$	1.61	$1\frac{7}{8}$	2.92	3.	
2	2.06	$2\frac{5}{8}$	4.17	4.38	
$2\frac{1}{2}$	2.46	$2\frac{7}{8}$	5.	5.25	
3	3.06	$3\frac{1}{2}$	8.	8.4	
$3\frac{1}{2}$	3.5	4	10.	10.5	
4	4.	$4\frac{1}{2}$	12.	12.6	
5	5.	$5\frac{9}{16}$	15.9	17.3	
6	6.	$6\frac{5}{8}$	20.7	22.4	
7	7.	$7\frac{5}{8}$	26.3	27.8	
8	8.	$8\frac{5}{8}$	29.9	33.7	

SPECIAL LIGHT BRASS AND COPPER PIPE FURNISHED FROM  
STOCK AS REQUIRED.

EXTRA HEAVY TO ORDER.

### APPROXIMATE WEIGHT PER FOOT, LBS. AND OZ.

Size.	Aquaduct.	Extra Light.			Medium.	Strong.	Extra Strong.	Double Extra Strong.
		..	..	.6				
$\frac{1}{4}$	...	.8	..	.12	1.	1.4	1.8	...
$\frac{3}{8}$	...	.10	.12	1.	1.4	1.12	2.8	3.
$\frac{1}{2}$	...	.12	1.	1.12	2.	2.8	3.	3.8
$\frac{5}{8}$	...	.14	1.12	2.	2.8	3.	3.8	...
$\frac{3}{4}$	...	1.	1.8	2.	2.4	3.	3.8	4.
1	1.8	2.	2.8	3.4	4.	4.12	5.8	10.8
$1\frac{1}{4}$	2.	2.8	3.	3.12	4.12	6.	6.12	
$1\frac{1}{2}$	3.	3.8	4.	5.	6.	7.8	9.	
2	...	4.	5.	7.	8.	9.	12.	

### LARGER SIZES TO ORDER.

### SHEET LEAD, BRASS AND COPPER.

#### APPROXIMATE WEIGHT PER SQUARE FOOT.

Thickness.	LEAD.	BRASS.			COPPER.
		2.	3.	4.	
$\frac{3}{64}$	3	3	4	4	2.1
$\frac{1}{16}$	4	4	5	5	3.
$\frac{5}{64}$	5	5	5	5	3.7
$\frac{3}{32}$	6	6	6	6	4.2
$\frac{1}{8}$	8	8	8	8	5.8
$\frac{3}{16}$	12	12	12	12	8.3
$\frac{1}{4}$	16	16	16	16	12.
$\frac{3}{8}$	24	24	24	24	17.
$\frac{1}{2}$	32	32	32	32	21.

#### SPECIAL THICKNESS TO ORDER.

We will not attempt to give a list of the Mills, Steel Works, Factories, Electric Light Plants, Etc., fitted complete for STEAM, WATER, GAS, OIL and HYDRAULIC purposes, in all parts of the United States; but only refer to a few

## HIGH-PRESSURE POWER PLANTS

for Traction Roads fitted by us.

ALLEGHENY TRACTION CO.,	Allegheny, Pa.
CENTRAL TRACTION CO.,	Pittsburg, Pa.
DUQUESNE TRACTION CO.,	" "
ELECTRIC TRACTION CO.,	Philadelphia, Pa.
Two Power Houses.	
FAIRHAVEN & WESTVILLE R. R. CO.,	New Haven, Conn.
HESTONVILLE, MANTUA & FAIRMOUNT R. R. CO.,	Philadelphia, Pa.
NASSAU ELECTRIC R. R. CO.,	Brooklyn, N. Y.
PHILADELPHIA TRACTION CO.,	Philadelphia, Pa.
Three Power Houses.	
PITTSBURGH, ALLEGHENY & MANCHESTER TRACTION CO.,	Allegheny, Pa.
PLEASANT VALLEY PASS. RAILWAY,	" "
WORCESTER TRACTION CO.,	Worcester, Mass.
BROOKLYN CITY ELECTRIC RAILWAY,	Brooklyn, N. Y.
Main Steam Lines from 8 inch to 20 inch bent by us for this plant.	
" " Line STEEL FITTINGS machined by us for this plant.	

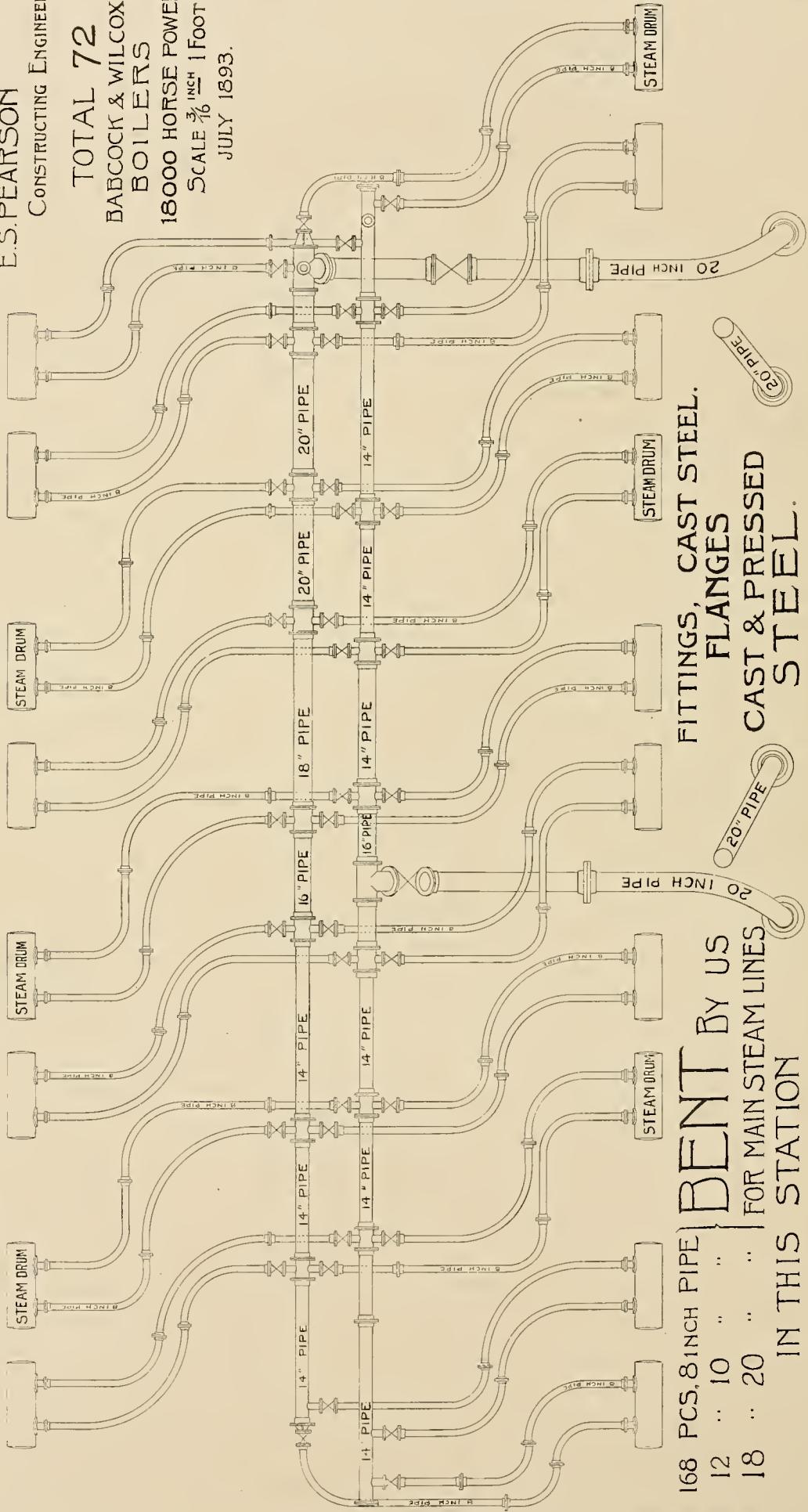
PLANS, SPECIFICATIONS and ESTIMATES submitted for  
High and Low Pressure Steam, Exhaust and Condenser Piping  
For complete or any part of Power Plants.

We also cut, bend and fit pipe of all sizes to drawings and guarantee correctness of our work.

PLAN of MAIN STEAM LINES in LOWER FLOOR (UPPER FLOOR DUPLICATE) of BOILER HOUSE EASTERN STATION  
BROOKLYN CITY RAILWAY COMPANY, BROOKLYN, N. Y.

A technical line drawing of a horizontal cylindrical vessel, identified as a steam drum. It features a flanged top header with two vertical legs extending downwards, and a flanged side header with two vertical legs extending downwards. A rectangular label is attached to the side of the drum, reading 'STEAM DRUM'.

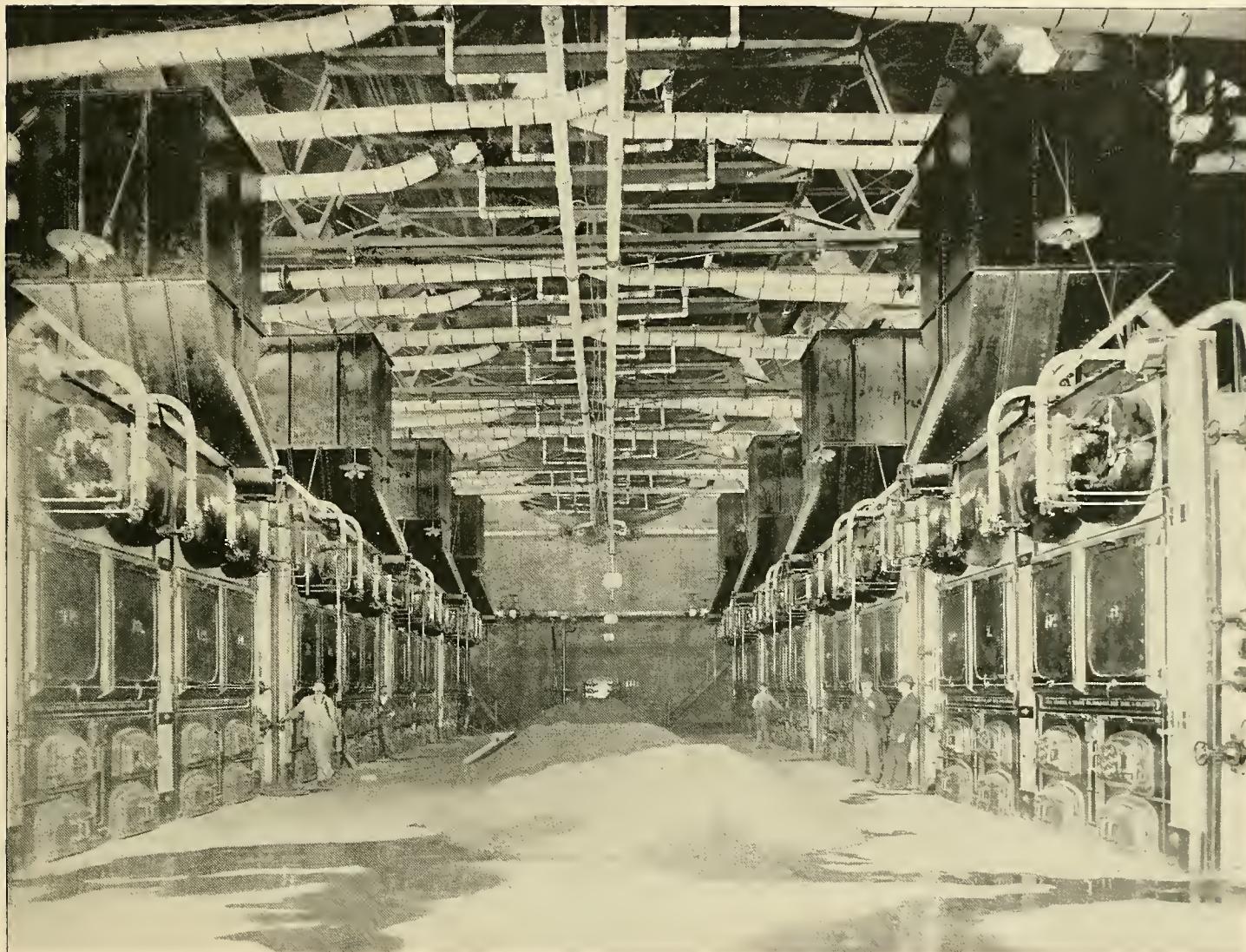
TOTAL 72  
BABCOCK & WILCOX  
BOILERS  
18000 HORSE POWER  
SCALE  $\frac{3}{16}$  INCH 1 Foot  
JULY 1893.



168 PCS, 8 1/2 INCH PIPE } BENT BY US  
 12 " 10 " " " } FOR MAIN STEAM LINES  
 18 " 20 " " " } IN THIS STATION



## LARGEST POWER HOUSE IN THE WORLD.



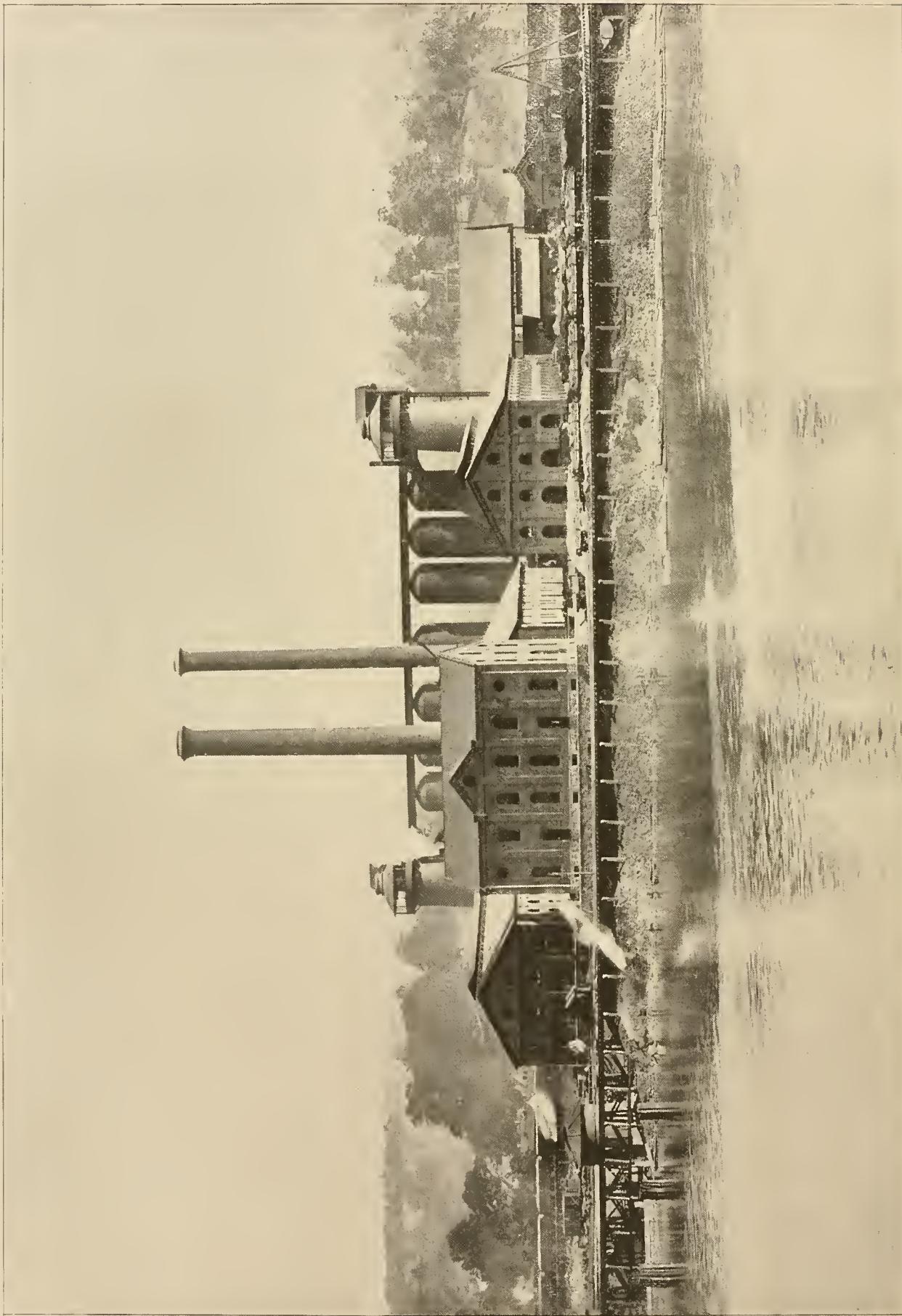
POWER HOUSE  
OF THE  
BROOKLYN CITY ELECTRIC RAILWAY CO.,  
BROOKLYN, N. Y.

On the opposite page a plan of the main steam lines (on one floor) of the largest power house in the world is shown.

By means of the long 8-inch **S** Bends running from drums to duplicate mains ample provision is made to take up all the expansion and contraction running with main lines and at right angles to same. The 20 inch mains drop to basement by means of bends of peculiar shape, then run under engine room floor and up to respective cylinders with 10 inch bends. By referring to cut at the top of this page the  $30^\circ$  bend in each 8 inch pipe where it connects into main trunk is shown, insuring condensation returning to boilers by gravity.

All fittings and flanges are heavy cast steel, precluding any possibility of breakage ever taking place.

## A MODEL BLAST FURNACE PLANT.



## MONONGAHELA FURNACES, MCKEESPORT, PA.

(DEPARTMENT OF NATIONAL TUBE WORKS.)

Designed by and erected under the supervision of FRANK C. ROBERTS, C. E., PHILADELPHIA, PA.

ERECTED 1889-90.

JOHN B. MILES, C. E.,  
Resident Engineer.

On the opposite page a view is given of the

## Monongahela Furnaces at McKeesport, Pa.,

Erected in 1889-90 for the National Tube Works Co. The photo was taken from the west side of the Monongahela River.

These furnaces were designed by, and erected under the supervision of, Frank C. Roberts, C. E., of Philadelphia, Pa.

No. 1 was put in blast Dec. 1st, 1890; No. 2 June 1st, 1891.

Dimensions of each furnace: 80 ft. high, 20 ft. diameter of Bosh.

Stove Equipment: 7 Cowper-Kennedy, each  $79\frac{1}{2}$  ft. high, 21 ft. diameter.

Blast is furnished by five Reynolds Improved Corliss Engines, made by the E. P. Allis Co., Milwaukee, Wis.; 42 inch Steam Cylinder, 84 inch Air Cylinder, 60 inch stroke.

Boiler equipment consists of 32 Boilers, 54 inch diameter, 30 feet long, two 18 inch flues.

Two Duplex Barr Pumps outside packed plungers, placed in dry well, take water from the river through 16 inch pipe, discharging through 12 inch pipe into reservoir.

Three Duplex Barr Pumps outside packed plungers, in basement of engine house, take water from reservoir through 18 inch pipe, discharging through two 12 inch pipes into two tanks 20 x 18 feet, located between engine and boiler house; also by-passed into two 12 inch lines running to furnaces and stoves.

Two Duplex Barr Pumps outside packed plungers, in basement of engine house, take water from reservoir through the above 18 inch pipe, discharging through two 5 inch lines to heaters and boilers, and by-passed to feed direct.

Six Berryman Heaters, one for each blowing engine and one for pumps are installed in the engine room.

See pages 120 and 121 for Bosh, Steam and Water Piping.

Annual Capacity of both furnaces 180,000 Net Tons.

## SHOWING BOSH FITTING, STYLE K.



## MONONGAHELA FURNACE BOSH,

Designed and erected under the supervision of FRANK C. ROBERTS, C. E., PHILADELPHIA, PA.

JOHN B. MILES, C. E.,  
Resident Engineer.

On the opposite page a view is given of one of the

## Monongahela Furnace Boshes

just before going into blast.

Thickness of bosh walls is  $3\frac{1}{2}$  inches; protected with five rows of Climax Bronze Bosh Plates (Kennedy's Patent), seven Tuyere Coolers, one Bronze Notch Cooler with Intermediate Cooler and Cinder Notch, and seven 7-inch Tuyeres are used.

Dam Plate made in two parts is used, and a  $1\frac{1}{2}$ -in. spray pipe is placed on top of riveted hearth jacket.

Provision is also made to spray furnace lining above mantel.

Main circular supply pipe is 9 inches in diameter. Waste trough  $10 \times 12$  inches.

The I. and K. system of Bosh fitting is used. Six 4-inch Manifolds are connected to circular supply pipe, and  $1\frac{1}{4}$ -inch connections taken from same to respective water-cooled devices.

$1\frac{1}{4}$ -inch No. 10 Tuyere cocks and brass Unions are used throughout. This style of bosh fitting gives easy access to every stop cock, and makes a neat and symmetrical system of bosh piping. (See cut.)

Steam provided by the thirty-two boilers is conveyed from each battery of two boilers, through 8-inch copper bends into two main lines, beginning with 10 inches and increasing to 14 inches; both connecting into a common 13-inch header in engine room, with 8-inch copper bend to each engine and 6-inch branch line to pumps in basement and dry well.

12-inch exhaust from each engine is brought to its respective heater; and exhaust from three circulating and two boiler feed pumps is connected together and taken into one heater. Exhaust is taken from the six heaters into a trunk line increasing from 12 to 30 inches, thence into atmosphere.

Steam, exhaust and water connections are by-passed, providing for all possible emergencies. Washouts are not only placed on the tanks and reservoir, but all large mains are provided with Washout Valves at lowest points.

For all large steam, exhaust and water lines on the entire plant O. D. (outside diameter) pipe, from 8 to 18 inches, inclusive, is used, with flanges shrunk and pinned on.

From 80 to 100 lbs. steam is carried.

## The COMPLETE STEAM AND WATER FITTING

has been done by us at the following FURNACE PLANTS:

ASHLAND IRON & STEEL CO.,	Ashland, Wis.
BUFFALO FURNACE CO.,	Buffalo, N. Y.
DECATUR FURNACE CO.,	Decatur, Ala.
DE BARDELEBEN COAL AND IRON CO.,	Bessemer, Ala. 2 Furnaces.
DULUTH BLAST FURNACE CO.,	Duluth, Minn.
FORT PAYNE FURNACE CO.,	Fort Payne, Ala.
LADY ENSLEY FURNACE CO.,	Sheffield, Ala.
MONONGAHELA FURNACE CO.,	McKeesport, Pa 2 Furnaces.
NASHVILLE IRON, STEEL AND CHARCOAL CO.,	Nashville, Tenn. 2 Furnaces
OREGON IRON AND STEEL CO.,	Oswego, Oregon.
POWELLS, ROBT. HARE SONS & CO.,	Saxton, Pa.
PULASKI DEVELOPMENT CO.,	Pulaski, Va.
ROSENA FURNACE CO.,	New Castle, Pa.
SALEM FURNACE CO.,	Salem, Va.
SHEFFIELD FURNACE CO.,	Sheffield, Ala.
SHEFFIELD & BIRMINGHAM COAL, IRON & R. W. CO.,	" " 3 Furnaces.
SLOSS IRON AND STEEL CO.,	Birmingham, Ala. 2 Furnaces.
VALENTINE ORE LAND ASSOCIATION,	Bellefont, Pa.
VANDERBILT IRON AND STEEL CO.,	Birmingham, Ala.
WATTS IRON AND STEEL SYNDICATE,	Middlesboro, Ky. 2 Furnaces.
WOODSTOCK IRON CO.,	Anniston, Ala. 2 Furnaces.

PLANS, SPECIFICATIONS and ESTIMATES submitted for STEAM EXHAUST and WATER  
PIPING COMPLETE for FURNACE PLANTS.

We have erected complete the water piping for the following

## BLAST FURNACE BOSSES:

ÆTNA IRON CO.,	Aetna, Tenn.
ASHLAND IRON AND STEEL CO.,	Ashland, Wis.
BELLAIRE NAIL WORKS,	Bellaire, O. (Copper Pipe.)
BRIER HILL IRON AND STEEL CO.,	Brier Hill, O.
BUFFALO FURNACE CO.,	Buffalo, N. Y.
CARRIE FURNACE CO.,	Rankin, Pa. 2 Boses.
CHERRY VALLEY IRON CO.,	Leetonia, O.
CHICAGO FURNACE CO.,	South Chicago, Ill.
CLIFTON IRON CO.,	Ironaton, Ala.
CORNWALL IRON CO.,	Cornwall, Pa. 2 Boses. (Galvanized Pipe.)
DECATUR FURNACE CO.,	Decatur, Ala.
DEBARDEBEN COAL AND IRON CO.,	Bessemer, Ala. 2 Boses.
DULUTH BLAST FURNACE CO.,	Duluth, Minn.
FORT PAYNE FURNACE CO.,	Fort Payne, Ala.
GADSDEN-ALABAMA FURNACE CO.,	Gadsden, Ala.
HAINSWORTH STEEL CO.,	Allegheny, Pa.
JEFFERSON IRON WORKS,	Steubenville, O.
JUNCTION IRON CO.,	Mingo Junction, O.
JUNIATA MINING AND MANUFACTURING CO.,	Newport, Pa.
KING, GILBERT & WARNER CO.,	Columbus, O.
KING, GILBERT & WARNER CO.,	Moxahala, O.
LADY ENSLEY FURNACE CO.,	Sheffield, Ala.
MINERVA FURNACE CO.,	Milwaukee, Wis.
MONONGAHELA FURNACE CO.,	McKeesport, Pa. 2 Boses.
NASHVILLE IRON, STEEL AND CHARCOAL CO.,	Nashville, Tenn. 2 Boses.
NORTH CORNWALL FURNACE,	North Cornwall, Pa. (Galvanized Pipe.)
OREGON IRON AND STEEL CO.,	Oswego, Ore.
POUGHKEEPSIE IRON CO.,	Poughkeepsie, N. Y. (Copper Pipe.)
POWELLS, ROBT. HARE, SONS & CO.,	Saxton, Pa.
PULASKI DEVELOPMENT CO.,	Pulaski, Va.

## Furnace Bosh Fitting Continued.

RIVERSIDE IRON WORKS,	WHEELING, W. VA.	
ROANOKE IRON CO.,	ROANOKE, VA.	
ROBESONIA IRON CO.,	ROBESONIA, PA.	
ROME IRON CO.,	ROME, GA.	
ROSENA FURNACE CO.,	NEW CASTLE, PA.	
ALEM FURNACE CO.,	SALEM, VA.	
SALEM IRON CO.,	LEETONIA, O.	2 BOSHES.
SHEFFIELD FURNACE CO.,	SHEFFIELD, ALA.	
SHEFFIELD AND BIRMINGHAM COAL, IRON & R. W. CO.,	SHEFFIELD, ALA.	3 BOSHES.
SHENANGO VALLEY STEEL CO.,	NEW CASTLE, PA.	(COPPER PIPE.)
SLOSS IRON AND STEEL CO.,	BIRMINGHAM, ALA.	2 BOSHES.
UNION ROLLING MILL CO.,	CLEVELAND, O.	
VALENTINE ORE LAND ASSOCIATION,	BELLEFONT, PA.	
VANDERBILT IRON AND STEEL CO.,	BIRMINGHAM, ALA.	
VIRGINIA IRON AND R. W. CO.,	GOSHEN, VA.	
WATTS IRON AND STEEL SYNDICATE,	MIDDLESBORO, KY.	2 BOSHES.
WOODSTOCK IRON CO.,	ANNISTON, ALA.	2 BOSHES.
YORK IRON CO.,	BLACK RIVER FALLS, WIS.	

PLANS, SPECIFICATIONS and ESTIMATES submitted for complete Bosh Fitting of Iron, Galvanized, Brass or Copper Pipe, or we will furnish all pipe cut and bent to exact requirements according to drawings or sketches furnished or to our measurements, with full instructions for erection when customers wish to do their own fitting.

# PLANS AND SPECIFICATIONS

SUBMITTED FOR  
PIPE WORK OF ANY DESCRIPTION.

## HIGH PRESSURE STEAM,

TESTED TO 300 LBS. PRESSURE.

## HYDRAULIC PIPING,

FROM 500 TO 3000 LBS. PRESSURE.

AMMONIA AND BRINE,  
COMPRESSED AIR,  
HYDRAULIC ELEVATOR,

## PIPING

TESTED TO

500 LBS. PRESSURE.

EXHAUST, CONDENSER, ECONOMIZER  
PIPING, ETC., ETC.

## WE GUARANTEE

AMPLE SIZES AND STRENGTH OF ALL MATERIALS . . . . .  
AMPLE PROVISION FOR EXPANSION AND CONTRACTION—BRACING AND  
STAYING, AND AUTOMATIC DRAINING. . . . .  
ALSO PROVIDE VALVES AND BY-PASSES IN ALL IMPORTANT LINES, TO KEEP  
PLANTS IN CONSTANT OPERATION. . . . .

## SATISFACTION GUARANTEED

IN EVERY PARTICULAR, AT MINIMUM FIRST COST, AND  
**MINIMUM DAILY COST** OF OPERATION.

## CATALOGUE F, CONTAINING



BLAST FURNACE SPECIALTIES,  
ON APPLICATION.













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